SHB120 Series
Intel® Socket 1155 Core™i7 / Core™i5 / Core™i3 / Processor
PICMG® 1.3 Full-Size CPU Card
User's Manual

Disclaimers

This manual has been carefully checked and believed to contain accurate information. Axiomtek Co., Ltd. assumes no responsibility for any infringements of patents or any third party's rights, and any liability arising from such use.

Axiomtek does not warrant or assume any legal liability or responsibility for the accuracy, completeness or usefulness of any information in this document. Axiomtek does not make any commitment to update the information in this manual.

Axiomtek reserves the right to change or revise this document and/or product at any time without notice.

No part of this document may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of Axiomtek Co., Ltd.

Caution

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

December 2013, Version A2

Printed in Taiwan

ESD Precautions

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

Do not remove boards or integrated circuits from their anti-static

Packaging until you are ready to install them.

Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.

Wear a wrist-grounding strap, available from most electronic

Component stores, when handling boards and components.

Trademarks Acknowledgments

Axiomtek is a trademark of Axiomtek Co., Ltd.

Windows® is a trademark of Microsoft Corporation.

AMI are trademarks of American Megatrend Inc.

IBM, PC/AT, PS/2, VGA are trademarks of International Business

Machines Corporation.

Intel® Core™ i3 LGA1155 Desktop Processor,

Intel® Core™ i5 LGA1155 Desktop Processor,

Intel® Core™ i7 LGA1155 Desktop Processor,

are trademarks of Intel Corporation

Winbond is a trademark of Winbond Electronics Corp.

Other brand names and trademarks are the properties and registered brands of their respective owners.

Table of Contents

MEMO:

CHAPTER 1
INTRODUCTION



The SHB120 PICMG® 1.3 full-size Single Board Computer supports LAG1155 socket H2 for Intel® Core™ i3 Desktop Processor, Intel® Core™ i5 Desktop Processor, Core™ i7 Desktop Processor with 32nm technology and Transfer Rate 1333/1600 MHz. The board integrates Intel® Q77 chipset that delivers outstanding system performance through high-bandwidth interfaces, multiple I/O functions for interactive applications and various embedded computing solutions. There are two 240-pin DDR3 DIMM sockets for dual channel DDR3 1333/1600, maximum memory capacity up to 16GB. The board also features dual Gigabit Ethernet, two SATA-6.0Gb/s and four SATA-3.0Gb/s and SATA RAID 0/1/5/10 by PCH. Ten USB 2.0 & four USB 3.0 high speed compliant ports and built-in Intel® HD Audio Digital Header can achieve the best stability and reliability for industrial applications.

1.1 Specifications

- **CPU**
  - Intel® Core™ i3 Desktop Processor
  - Intel® Core™ i5 Desktop Processor
  - Intel® Core™ i7 Desktop Processor
- **System Chipset**
  - Intel® Q77
- **CPU Socket**
  - LAG1155 Socket
- **DRAM Transfer Rate**
  - 1333/1600 MHz
- **BIOS**
  - AMI BIOS via SPI interface with socket
- **System Memory**
  - Two 240-pin DDR3 1333/1600 DIMM sockets
  - Maximum up to 16GB DDR3 memory
- **L1, L2, L3 Cache: integrated in CPU**
- **Onboard Multi-I/O**
  - Parallel Port: one 26-pin 2.54-pitch box-header, SPP/EPP/ECP supported
  - Serial Port: one for RS-232/422/485 with 10-pin, 2.54-pitch box-header (COM1) and one port for RS-232 with 10-pin, 2.54-pitch box-header (COM2)
  - Floppy controller: one 34-pin, 2.54-pitch box-header supports two drives (1.44MB for each)
- **USB Interface**
  - Ten USB ports compliant with USB Spec. Rev. 2.0 (6 ports on board, 4 ports to SHB connector-C golden fingers)
  - Four USB ports compliant with USB Spec. Rev. 3.0 (2 ports on rear I/O, 2 ports on board)

- **Onboard Graphic**
  - Intel® Arrandale integrated a Graphic processing unit processor which goes with Q77 chipset with VGA, DisplayPort (co-lay with VGA) and DVI.
  - Memory Size --Intel® DVMT 5.0 supported; preallocated memory for frame buffer option as OS option:

    Windows XP:

    * For Total System Memory < 1GB,

    Graphics sharing memory = 128 MB Maximum;

    * For 1 GB to 1.5 GB Total System Memory,

    Graphics sharing memory = 512 MB Maximum;

    * For 1.5 GB to 2 GB Total System Memory,

    Graphics sharing memory = 768 MB Maximum;

    * For 2 GB and Above Total System Memory,

    Graphics sharing memory = 1GB Maximum.

    Windows Vista:

    * Graphics sharing memory max to 0.5* (OS Ram Size – 512)
  - Resolution -- Analog output -- the analog port utilizes an

    integrated 400MHz 24-bit RAMDAC that can directly drive a standard progressive scan analog monitor up to a resolution of 2048x1536 pixels with 32-bit color at 75 Hz
  - Analog Output Interface -- CRT from DAC output via 15-pin D-Sub connector on the edge; CRT always ON supported

- **Ethernet**
  - The LAN1/LAN2 are Intel 82579LM with iAMT 7.0 / Intel 82574L Ethernet controller support 10/100/1000 Mb/s

- **Serial ATA**
  - Two Serial ATA-6Gb/s and Four Serial ATA-3Gb/s performance and SATA RAID 0/1/5/10 by Q77

- **Audio**
  - 10-pin 2.0 pin-header (Intel® HD Audio Digital Header)
- **Hardware Monitoring**
  - Monitoring temperatures, voltages, and cooling fan status
- **Watchdog Timer**
  - Reset Supported (1-255 level)
- **Dimensions**
  - 338mm x 126mm
- **Expansion interface:**
  - 1 PCI-E x16(Gen.3)
  - 1 PCI-E x4(or 4 PCI-E x1) (Gen.2)
  - 4 PCI

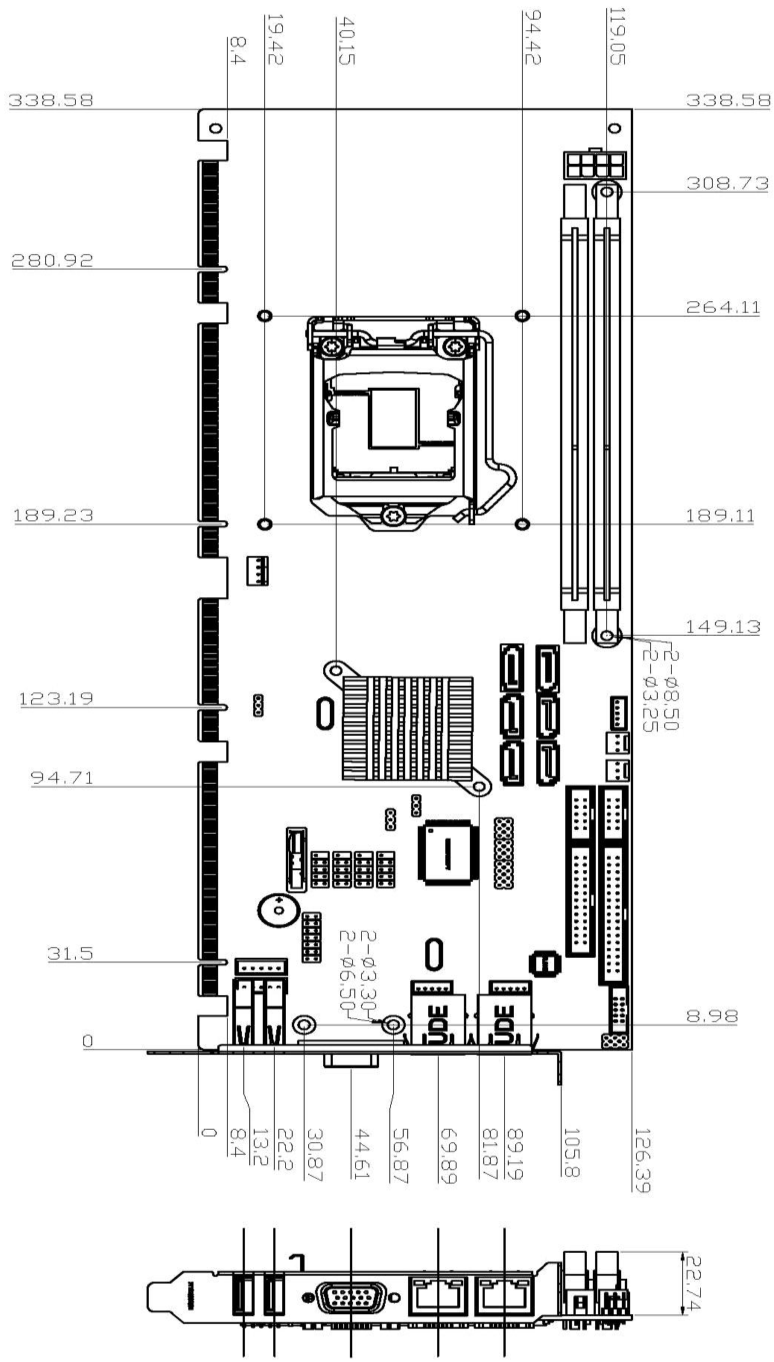
NOTE: All specifications and images are subject to change without notice.

1.2 Utilities Supported

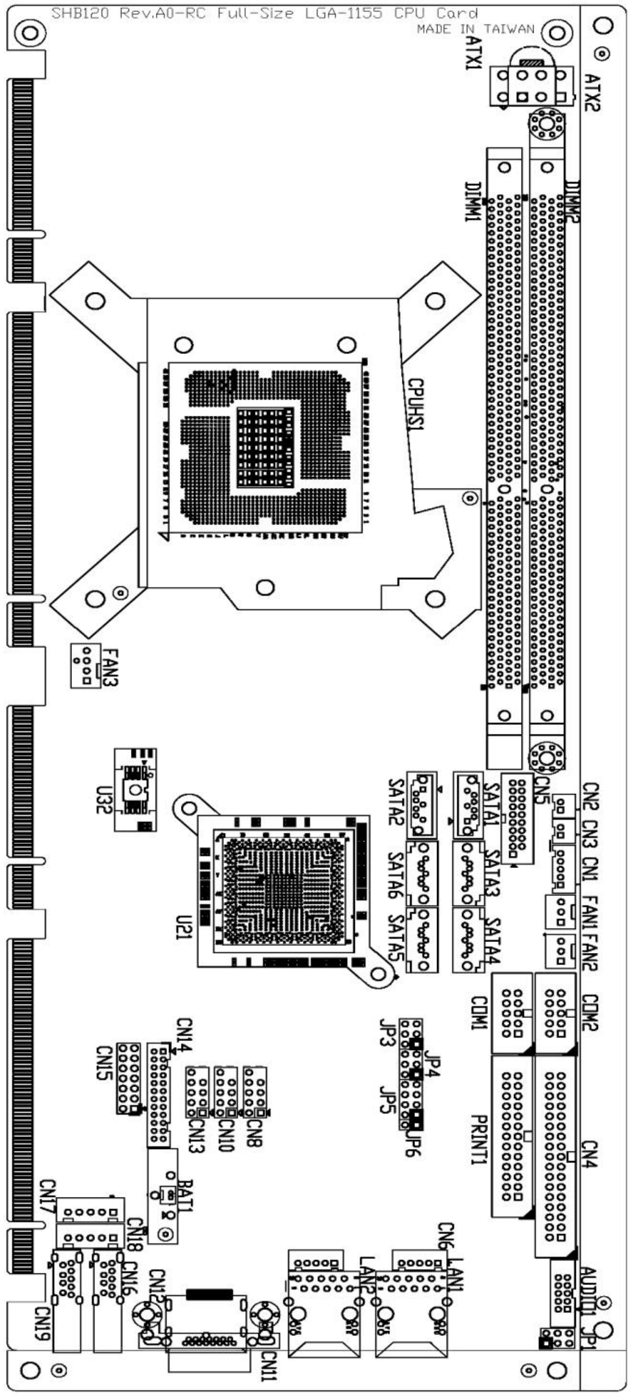
- **Intel® Q77 Utility and Drivers**
- **VGA Drivers**
- **Ethernet Utility and Drivers**
- **RAID Utility**
- **iAMT Utility and Drivers**
- **TPM Utility**

CHAPTER 2
JUMPERS AND CONNECTORS

2.1 Board Dimension



2.2 Board Layout



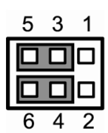
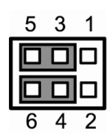
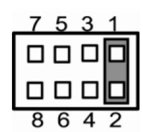
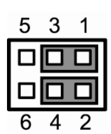
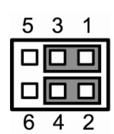
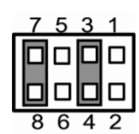
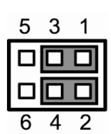
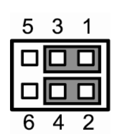
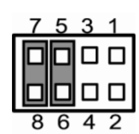
2.3 Jumper Settings

Proper jumper settings configure the SHB120 to meet your application purpose. We are herewith listing a summary table of all jumpers and default settings for onboard devices, respectively.

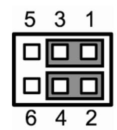
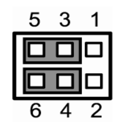
Jumper	Description	Jumper Setting
JP3	COM1 Mode Selection : RS-232	Short 3-5 , 4-6
JP4	COM1 Mode Selection : RS-232	Short 3-5 , 4-6
JP5	COM1 Mode Selection : RS-232	Short 1-2
JP1	Audio Amplifier Selection : Disable	Short 1-3 , 2-4
JP8	Clear RTC : Normal	Short 1-2
JP6	Auto Power On Open : Always Power On (Default) Short : Always Power Off	Open 1-2

2.3.1 COM1 Mode Select Jumpers for RS232/422/485 (JP3, JP4, JP5)

These jumpers select the COM1 port's communication mode to operate RS-232 or RS-422/485

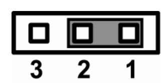
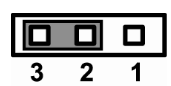
Function	Jumper Setting		
	JP3	JP4	JP5
RS-232 (Default)			
RS-422			
RS-485			

2.3.2 Audio Amplifier Jumper (JP1)

Function	Jumper Setting
Disable (Default)	
Enable	

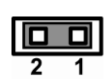
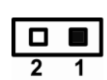
2.3.3 Clear RTC Jumper (JP8)

You may need to use this jumper to clear the RTC if incorrect RTC settings.

Function	Jumper Setting
Normal (Default)	
Clear ME	

2.3.4 Auto Power on Jumper Selection (JP6)

If this jumper is enabled for AC power input, the system will be automatically power on without pressing soft power button. If this jumper is disabled for AC power input, it is necessary to manually press soft power button to power on the system.

Description	Function	Jumper Setting
Auto Power on jumper seleciton	disable Auto power on	
	enable Auto power on(Default)	

2.4 Connectors

Connectors connect this board with other parts of the system. Loose or improper connection might cause problems. Make sure all connectors are properly and firmly connected.

Here is a summary table shows you all connectors on the board.

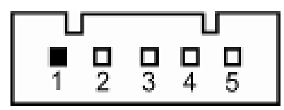
Connector	Label
SMBUS	CN1
Floppy Connecter	CN4
Internal USB3.0 Connector port 2/3	CN5
LAN2 External LED	CN6
LAN1 External LED	CN7
USB Port 4/5	CN8
USB Port 6/7	CN10
VGA Port	CN11
Display Port (BOM Option)	CN12
USB Port 8/9	CN13
DVI Connector	CN14
Axiomtek Front Panel	CN15
USB2.0/3.0 Port 1	CN16
Keyboard	CN17
Mouse	CN18
USB2.0/3.0 Port 0	CN19
SYS FAN	FAN1
AUX FAN	FAN2
CPU FAN	FAN3
RJ45 (WG82579LM)	LAN1
RJ45 (WG82574L)	LAN2
Print Connecter	PRINT1
SATA 0 6Gb(SATA3)	SATA1
SATA 1 6Gb(SATA3)	SATA2
SATA Port 2	SATA3

Connector	Label
SATA Port 3	SATA4
SATA Port 4	SATA5
SATA Port 5	SATA6
COM1 Connecter	COM1
COM2 Connecter	COM2
Audio Connector	AUDIO1
ATX Connecter	ATX2

2.4.1 SMBUS Connector (CN1)

Connector SMBUS CN1 is for SMBUS interface support.

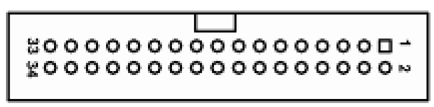
Pin	Signal
1	CLOCK
2	N.C
3	GND
4	DATA
5	+5V



2.4.2 Floppy Disk Port Connector (CN4)

The board provides a 34-pin header type connector, CN4, supporting up to two floppy drives. The floppy drives may be any one of the following types: 5.25" 360KB/1.2MB and 3.5" 720KB/1.44MB/2.88MB.

Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	Drive Density Select	3	GND
4	No connector	5	GND	6	No connector
7	GND	8	Index#	9	GND
10	Motor enable A#	11	GND	12	No connector
13	GND	14	Drive select A#	15	GND
16	No connector	17	GND	18	Direction#
19	GND	20	STEP#	21	GND
22	Write data#	23	GND	24	Write gate#
25	GND	26	Track 0 #	27	GND
28	Write protect#	29	No connector	30	Read data#
31	GND	32	Head selection#	33	No connector
34	Disk change#				

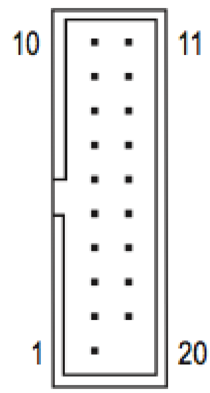


2.4.3 Internal USB Connectors (CN5)

The 19-pin standard Universal Serial Bus (USB 3.0) connectors, CN5 on this board is for installing versatile USB 3.0 interface peripherals.

Pin	Signal	Pin	Signal
1	VBUS0		
2	SSRX2-	19	VBUS1
3	SSRX2+	18	SSRX3-
4	GND	17	SSRX3+
5	SSTX2-	16	GND
6	SSTX2+	15	SSTX3-
7	GND	14	SSTX3+
8	USB2-	13	GND
9	USB2+	12	USB3-
10	ID	11	USB3+

CN5

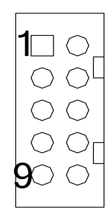


2.4.4 Internal USB Connectors (CN8, CN10, CN13)

The 10-pin standard Universal Serial Bus (USB 2.0) connectors, CN8/10/13 on this board are for installing versatile USB interface peripherals.

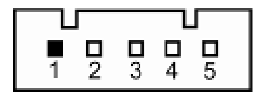
Pin	Signal	Pin	Signal
1	USB_PWR	2	USB_PWR
3	USB4-	4	USB5-
5	USB4+	6	USB5+
7	GND	8	GND
9	GND	10	GND

CN8



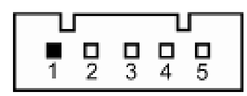
2.4.5 LAN2 LED Connectors (CN6)

Pin	Signal
1	+ 3.3V
2	LINK_ACT LED(-)
3	100, Low Active
4	+3.3V
5	1000, Low Active



2.4.6 LAN1 LED Connectors (CN7)

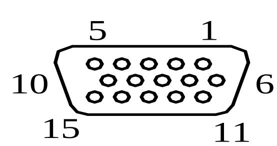
Pin	Signal
1	+ 3.3V
2	LINK_ACT LED(-)
3	100, Low Active
4	+3.3V
5	1000, Low Active



2.4.7 DB15 CRT Connector (CN11) Co-layout with CN12

CN11 is a DB15 connector commonly used for the CRT Monitor.

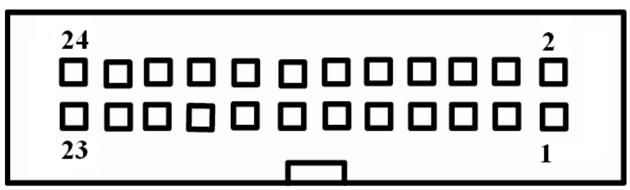
Pin	Signal	Pin	Signal	Pin	Signal
1	Red	2	Green	3	Blue
4	N.C	5	GND	6	DETECT
7	GND	8	GND	9	VCC
10	GND	11	N.C	12	DDC DATA
13	Horizontal Sync	14	Vertical Sync	15	DDC CLK



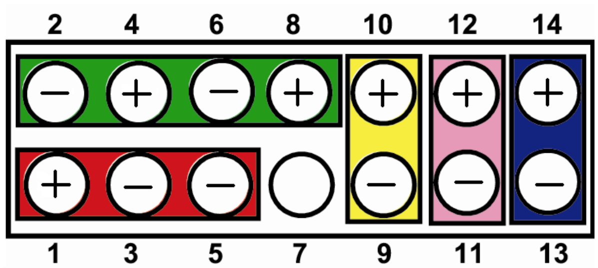
2.4.8 DVI-D Pin Header (CN14)

This board supports a 24-pin header (CN14) for DVI-D, via DVI-D cable.

Pin	Signal	Pin	Signal	Pin	Signal
1	Data2-	2	Data2+	3	GND
4	N.C.	5	N.C.	6	DDC CLK
7	DDC Data	8	N.C.	9	Data1-
10	Data1+	11	GND	12	N.C.
13	N.C.	14	+5V	15	GND
16	HPD	17	Data0-	18	Data0+
19	GND	20	N.C.	21	N.C.
22	GND	23	Clock+	24	Clock-



2.4.9 Front Panel Connector (CN15)



- **Power LED**

This 3-pin connector denoted as Pin 1 and Pin 5 connects the system power LED indicator to such a switch on the case. Pin 1 is assigned as +, and Pin 5 as -. The Power LED lights up when the system is powered ON. Pin 3 is defined as GND.

- **External Speaker and Internal Buzzer Connector**

Pin 2, 4, 6 and 8 can be connected to the case-mounted speaker unit or internal buzzer. While connecting the CPU card to an internal buzzer, please short pins 2-4; while connecting to an external speaker, you need to set pins 2-4 to Open and connect the speaker cable to pin 8 (+) and pin 2 (-).

- **ATX Power On/Off Button**

This 2-pin connector denoted as Pin 9 and 10 connects the front panel's ATX power button to the CPU card, which allows users to control ATX power supply to be power on/off.

- **System Reset Switch**

Pin 11 and 12 can be connected to the case-mounted reset switch that reboots your computer instead of turning OFF the power switch. It is a better way to reboot your system for a longer life of the system's power supply.

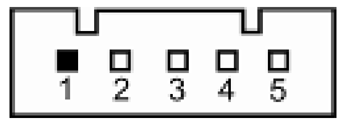
- **HDD Activity LED**

This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. Pin 13 and 14 connect the hard disk drive to the front panel HDD LED, Pin 13 assigned as -, and Pin 14 as +.

2.4.10 PS/2 Keyboard, Mouse Connectors (CN17, CN18)

The board provides the Keyboard (CN17) / Mouse (CN18) interface with a 5-pin connecter.

Pin	Signal
1	Clock
2	DATA
3	No connector
4	GND
5	5VSBY

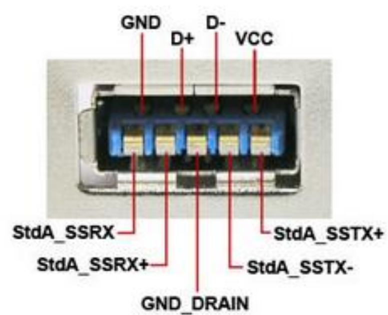


2.4.11 External USB 3.0 Port Connectors (CN16, CN19)

The 9-pin standard Universal Serial Bus (USB 3.0) port connector on the board is for the installation of peripherals supporting the USB interface.

Pin	Signal
1	VCC
2	D-
3	D+
4	GND
5	StdA_SSRX-
6	StdA_SSRX+
7	GND_DRAIN
8	StdA_SSTX-
9	StdA_SSTX+
10	Shield

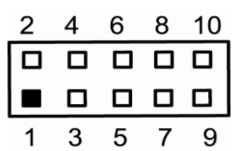
CN19



2.4.12 RS232/422/485 Pin Assignment (COM1)

The serial interface for the board consists of COM1 support for RS-232 and COM1 for RS-232/RS-422/RS-485.

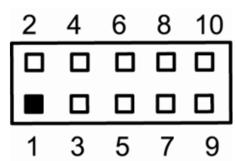
Pin	Signal Name		
	RS-232	RS-422	RS-485
1	Data Carrier Detect (DCD)	TX-	DATA-
2	Data Set Ready (DSR)	No connector	No connector
3	Receive Data (RXD)	TX+	DATA+
4	Request to Send (RTS)	No connector	No connector
5	Transmit Data (TXD)	RX+	No connector
6	Clear to Send (CTS)	No connector	No connector
7	Data Terminal Ready (DTR)	RX-	No connector
8	Ring Indicator (RI)	No connector	No connector
9	Ground (GND)	GND	GND
10	Disconnect(NI)	NI	NI



2.4.13 COM Port RS-232 Pin Assignment (COM2)

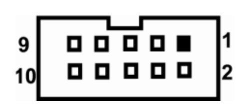
COM2 Serial Port 10-pin (Box-header) Connector Pin Assignment list

Pin	Signal	Pin	Signal
1	Data Carrier Detect (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request to Send (RTS)
5	Transmit Data (TXD)	6	Clear to Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)	10	Disconnect(NI)



2.4.14 Intel® HD Audio Digital Header (AUDIO1)

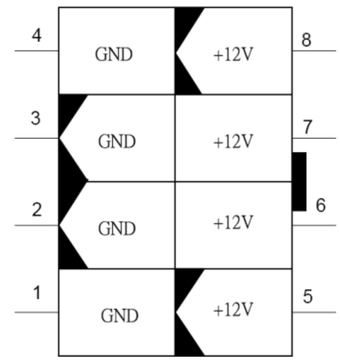
Pin	Signal	Pin	Signal
1	MIC IN	2	GND
3	LINE_IN_L	4	GND
5	LINE_IN_R	6	GND
7	LINE_OUT_L	8	GND
9	LINE_OUT_R	10	GND



2.4.15 ATX 8 Pin 12V IN Connector (ATX2)

You can connect it to the ATX12V power supply for CPU Core Voltage.

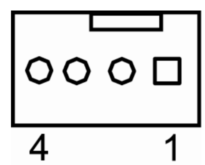
Pin	Signal
1	GND
2	GND
3	GND
4	GND
5	+12V
6	+12V
7	+12V
8	+12V



2.4.16 A CPU fan is always needed for cooling CPU heat (FAN3)

The CPU fan connector FAN3 provides power to the CPU fan.

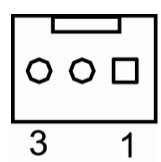
Pin	Signal
1	Ground
2	+12V
3	Rotation Detection
4	Speed Control



2.4.17 System & Auxiliary Fan Connectors (FAN1, FAN2)

You can connect the system cooling fan cable to FAN1/FAN2 for system cooling fan power.

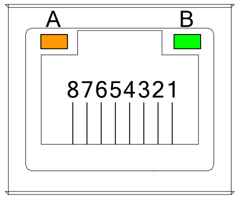
Pin	Signal
1	GND
2	+12V
3	Rotation Detection



2.4.18 Ethernet RJ-45 Connectors (LAN1, LAN2)

The RJ-45 connectors LAN1 and LAN2 are for Ethernet. To connect the board to 100-Base-T or 1000-Base-T hub, just plug one end of the cable into LAN1 and connect the other end (phone jack) to a 100-Base-T hub or 1000-Base-T hub.

Pin	Signal
1	Tx+ (Data transmission positive)
2	Tx- (Data transmission negative)
3	Rx+(Data reception positive)
4	RJ-1(For 1000 base T-Only)
5	RJ-1(For 1000 base T-Only)
6	Rx- (Data reception negative)
7	RJ-1(For 1000 base T-Only)
8	RJ-1(For 1000 base T-Only)
A	Active LED
B	Speed LED



2.4.19 Parallel Port Connector (PRINT1) Print Port Connector

This board has a multi-mode parallel port to support:

- **Standard Mode:**

  IBM PC/XT, PC/AT and PS/2™ are compatible with bi-directional parallel port.

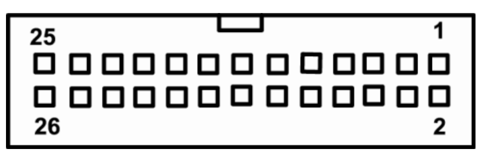
- **Enhanced Mode:**

  Enhance parallel port (EPP) is compatible with EPP 1.7 and EPP 1.9 (IEEE 1284 compliant).

- **High Speed Mode:**

  Microsoft and Hewlett Packard extended capabilities port (ECP) is IEEE 1284 compliant.

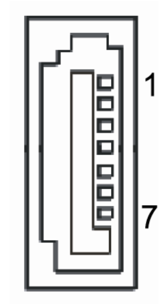
Pin	Signal	Pin	Signal
1	Strobe#	2	Auto Form Feed#
3	Data 0	4	Error#
5	Data 1	6	Initialize#
7	Data 2	8	Printer Select In#
9	Data 3	10	GND
11	Data 4	12	GND
13	Data 5	14	GND
15	Data 6	16	GND
17	Data 7	18	GND
19	Acknowledge#	20	GND
21	Busy	22	GND
23	Paper Empty#	24	GND
25	Printer Select	26	N.C



2.4.20 SATA Connectors (SATA1(3.0) ,SATA2(3.0),SATA3,SATA4,SATA5,SATA6)

These SATA connectors are for high-speed SATA interface ports and they can be connected to hard disk devices.

Pin	Signal
1	GND
2	SATA_TX+
3	SATA_TX-
4	GND
5	SATA_RX-
6	SATA_RX+
7	GND



CHAPTER 3
HARDWARE INSTALLATION

Before installing the processor, please access Intel® website for more detail Information.

Processor Integration Video (LGA1155)**:**

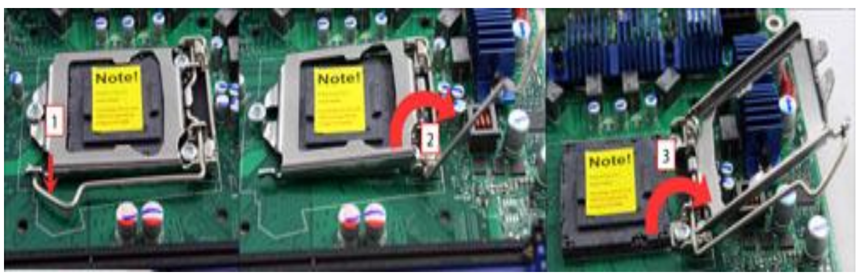
http://www.intel.com/support/tw/processors/sb/CS-030860.htm .

3.1 Installing the Processor

The LGA1155 processor socket comes with a cover to protect the processor. Please install the processor into the CPU socket step by step as below:

Step1 Opening the Socket:

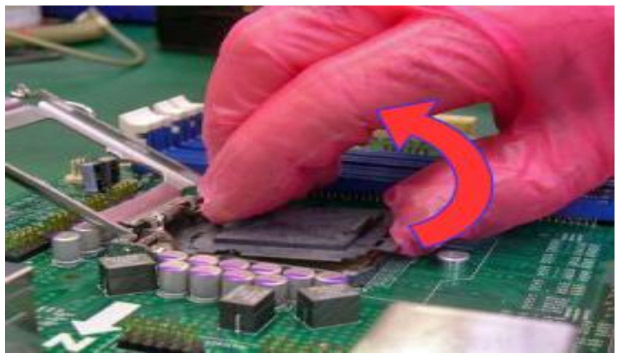
- Disengage load lever by releasing down and out on the hook. This will clear retention tab.
- Rotate load lever to open position at approximately 135°.
- Rotate load plate to open position at approximately 150°.



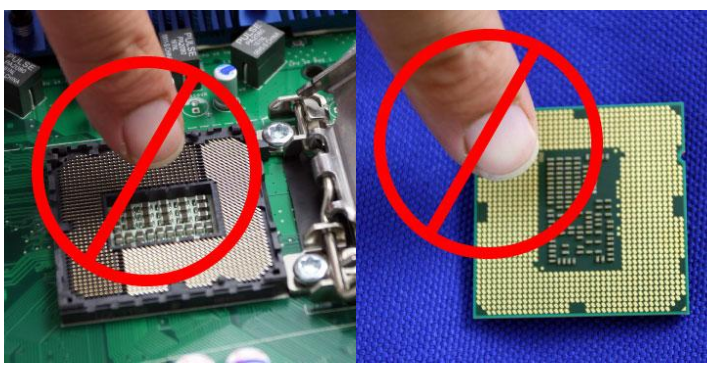
NOTE: Apply pressure to corner with right-hand thumb when opening or closing load lever - otherwise lever will bounce back (as a mouse trap) causing bent contacts.

Step2 Removing the socket protective cover:

- Place thumb against the front edge of the protective cover and rest index finger on the rear grip to maintain control of the cover.
- Lift the front edge of the protective cover to disengage from the socket. Keep control of the cover by holding the rear grip with index finger.
- Lift protective cover away from the socket, being careful not to touch the electrical contacts.



NOTE: Vertical removal is NOT recommended, as it requires higher force and can lead to socket contact damage.

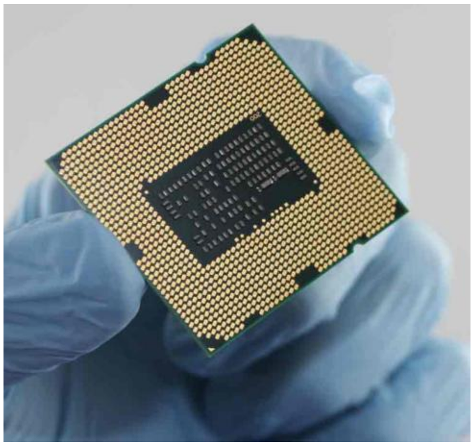


Caution: Never Touch Fragile Socket Contacts to Avoid Damage and Do Not Touch Processor Sensitive Contacts at Any Time During Installation

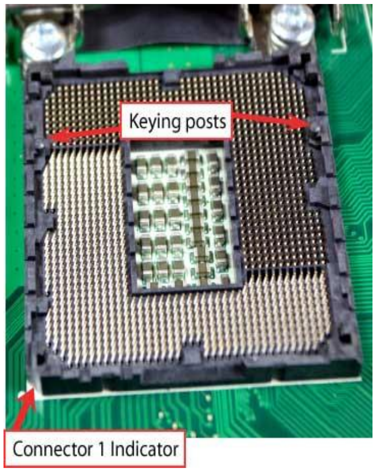
.

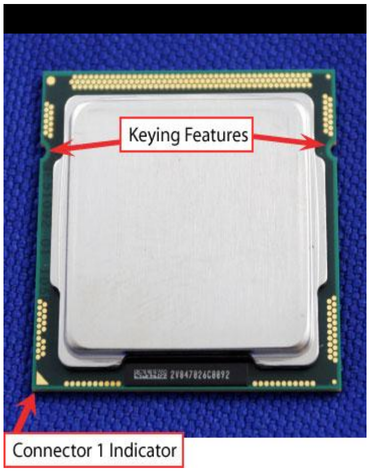
Step3 Processor installation:

- Lift processor package from shipping media by grasping the **substrate edges.** Scan the processor package gold pads for any presence of foreign material. If necessary, the gold pads can be wiped clean with a soft lint-free cloth and isopropyl alcohol.



- Scan the processor package gold pads for any presence of foreign material. If necessary, the gold pads can be wiped clean with a soft lint-free cloth and isopropyl alcohol.
- Locate connection 1 indicator on the processor which aligns with connection 1 indicator chamfer on the socket, and notice processor keying features that line up with posts along socket walls.

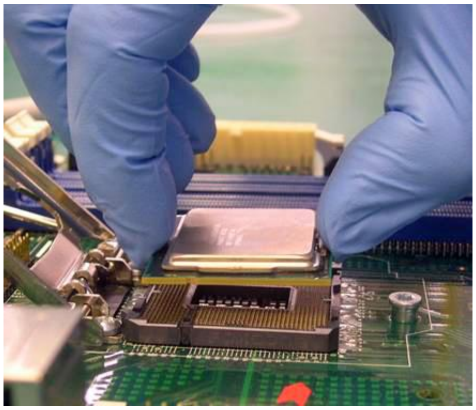




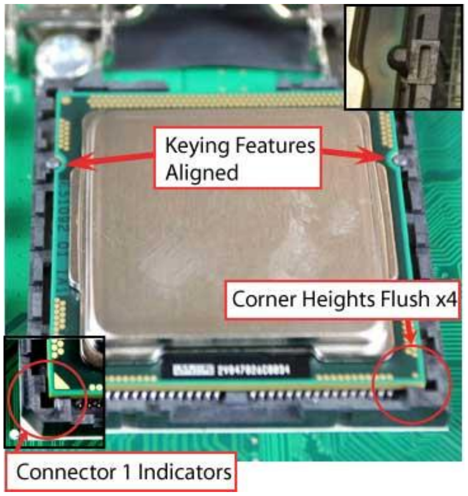
- Grasp the processor with thumb and index finger along the top and bottom edges. (Do not touch the Orientation Notches.) The socket will have cutouts for your fingers to fit into (see image below).

- Carefully place the processor into the socket body vertically (see image below).

NOTE: Tilting or roughly shifting it into place can damage socket contacts.
Caution: Do not use a vacuum pen for installation.



- Verify that package is within the socket body and properly connected to orientation keys.

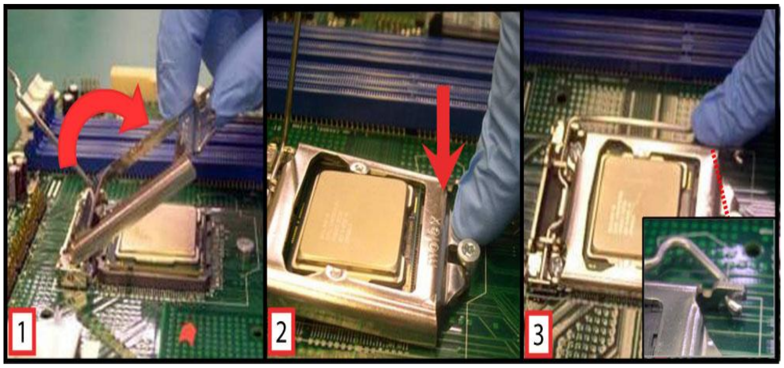


- **Close the socket (see image below):**

1. Gently lower the load plate.

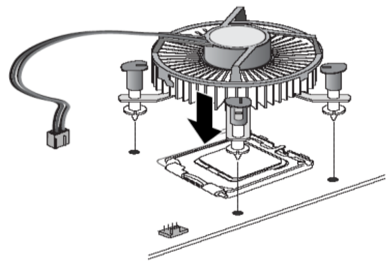
2. Make sure load plate's front edge slides under the shoulder screw cap as the lever is lowered.

3. Latch the lever under the top plate's corner tab, being cautious not to damage the motherboard with the tip of the lever.

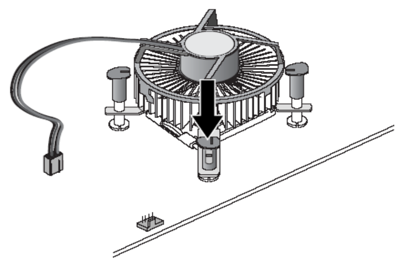


Step4 Fan heatsink handling:

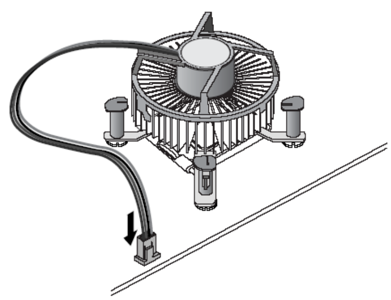
1. Orientate the CPU cooling fan to fixing holes on the board.



2. Screw the CPU cooling fan onto the board.



3. Make sure the CPU fan is plugged to the CPU fan connector.

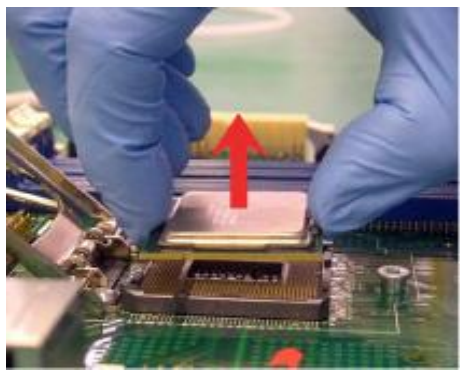


Step5 Removing the processor:

- Open the socket:
  A. Disengage the load lever.

  B. Open the load plate.

- Remove the Processor package, holding along the top and bottom edges, or by using a vacuum pen.
- Maintain Processor horizontal and remove Processor with a vertical motion to avoid damaging the socket contacts.



- Place the processor in a specially designed tray or ESD retainer for storage. Do not place directly on table resting on gold lands.
- Assemble LGA1155 socket protective cover:
  A Hold protective cover at 45 degree angle to the LGA1155 Socket

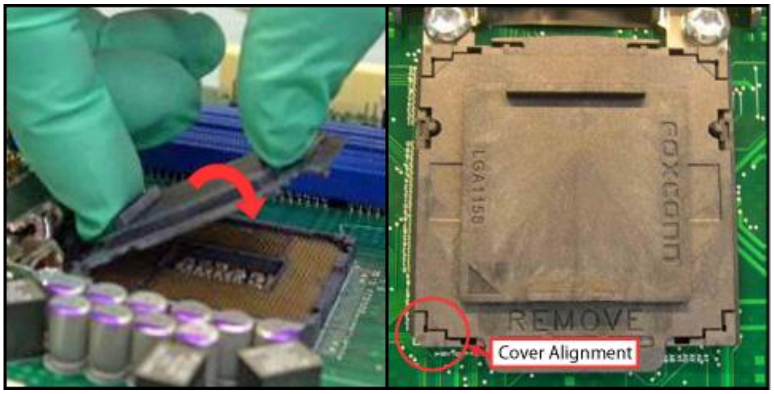
  B Carefully lower protective cover on hinge side first, to contact with the outside wall of the LGA1155 Socket:

  i. Engage protective cover retention features to outside of LGA1155 Socket, AND align 2 cover corners to socket corners (This step is critical to avoid Bent Contact Damage!)

  ii. Lower protective cover to attach to the LGA1155 Socket on Shoulder screw side

- Perform Visual and Tactile verification that protective cover is properly seated in the LGA1155 Socket:

  *Hold cover and move gently "side to side" to feel the play within the cover and the LGA1155 Socket.



- Close the socket load plate and engage the load lever (see image below).

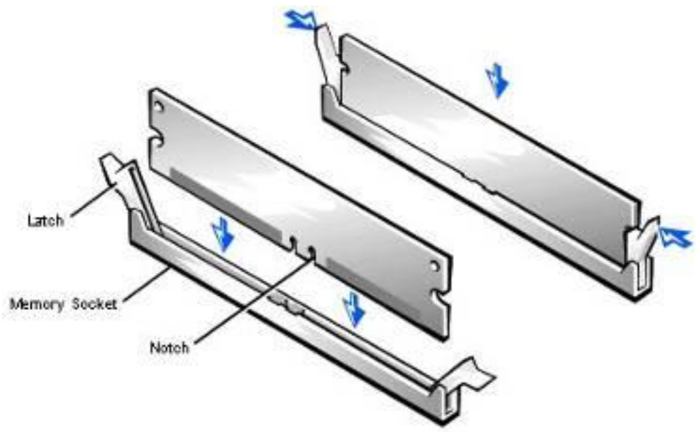


3.2 Installing the Memory

The board supports two 240-pin DDR3 DIMM memory sockets with maximum memory capacity up to 16GB.

Please follow steps below to install the memory modules:

- Push down latches on each side of the DIMM socket.
- Align the memory module with the socket that notches of memory module must match the socket keys for a correct installation.
- Install the memory module into the socket and push it firmly down until it is fully seated. The socket latches are levered upwards and clipped on to the edges of the DIMM.
- Install any remaining DIMM modules.



MEMO:

CHAPTER 4
HARDWARE DESCRIPTION

4.1 Microprocessors

The SHB120 Series supports Intel® Core™i7 / Core™i5 / Core™i3 / processors, which make your system operated under Windows® XP and Linux environments. The system performance depends on the microprocessor. Make sure all correct settings are arranged for your installed microprocessor to prevent the CPU from damages.

4.2 BIOS

The SHB120 Series uses AMI Plug and Play BIOS with a single 32Mbit SPI Flash.

4.3 System Memory

The SHB120 Series supports two 240-pin DDR3 DIMM sockets for a maximum memory of 16GB DDR3 SDRAMs. The memory module can come in sizes of 2GB, 4GB and 8GB.

4.4 I/O Port Address Map

The Intel® Core™i7 / Core™i5 / Core™i3 processors can communicate via I/O ports. There are total 1KB port addresses available for assignment to other devices via I/O expansion cards

Address	Devices
000-01F	DMA controller #1
020-02D, 024-025 028-029, 02C-02D	Interrupt controller #1
02E-02F	Forwarded to LPC(LPC Super I/O)
030-031, 034-035 038-039, 03C-03D	Interrupt controller #2
040-043, 050-053	Timer/Counter (8254)
060	Forwarded to LPC (Microcontroller)
061	NMI
062-066	Forwarded to LPC (Microcontroller)
070-077	Real time clock, NMI
080-091	DMA page register
092	Processor I/F(Reset Generator)
093-09F	DMA page register
0A0-0BF	Interrupt controller #2
0C0-0DF	DMA controller #2
0F0	Processor I/F
0F8-0FF	Math processor
170-177	Forward to SATA (SATA Controller)
1F0-1F7	Forward to SATA (SATA Controller)
376	Forward to SATA(SATA Controller)
378-37F	Parallel Port (LPT)
380-38F	SDLC #2
3A0-3AF	SDLC #1
3B0-3BF	MDA video card
3C0-3CF	EGA card
3D0-3DF	CGA card

Address	Devices
3F6	Forward to SATA(SATA Controller)
3F8-3FF	Serial port #1 (COM1)
2F8-2FF	Serial port #2 (COM2)

4.5 Interrupt Controller (IRQ) Map

The SHB120 Series is a 100% PC compatible control board. It consists of 16 interrupt request lines, and four out of them can be programmable. The mapping list of the 16 interrupt request lines is shown as the following table.

IRQ	Parity check error
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt rerouting from IRQ8 through IRQ15
IRQ3	Serial port #2
IRQ4	Serial port #1
IRQ5	PCI Device Share
IRQ6	Floppy Disk Controller
IRQ7	Parallel port
IRQ8	Real time clock
IRQ9	ACPI Controller
IRQ10	PCI Device Share
IRQ11	PCI Device Share
IRQ12	PS/2 Mouse
IRQ13	Math coprocessor
IRQ14	SATA Primary (Legacy Mode)
IRQ15	SATA Secondary (Legacy Mode)
3C0-3CF	EGA card
3D0-3DF	CGA card
3F6	Forward to SATA(SATA Controller)
3F8-3FF	Serial port #1 (COM1)
2F8-2FF	Serial port #2 (COM2)

:

CHAPTER 5
AMI BIOS UTILITY

This chapter provides users with detailed description how to set up basic system configuration through the AMIBIOS8 BIOS setup utility.

5.1 Starting

To enter the setup screens, follow the steps below:

- Turn on the computer and press the <F2> key immediately.
- After you press the <F2> key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as the Chipset and Power menus.

5.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process.

These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.

NOTE: Some of navigation keys differ from one screen to another.

← Left/Right	The Left <Arrow> keys allow you to select a setup screen.
↑↓ Up/Down	The Up and Down <Arrow> keys allow you to select a setup screen or sub-screen.
+– Plus/Minus	The Plus and Minus <Arrow> keys allow you to change the field value of a particular setup item.
Tab	The <Tab> key allows you to select setup fields.
F1	The <F1> key allows you to display the General Help screen.
F2	The <F2> key allows you to Load Previous Values.
F3	The <F3> key allows you to Load Optimized Defaults.
F4	The <F4> key allows you to save any changes you have made and exit Setup. Press the <F4> key to save your changes.
Esc	The <Esc> key allows you to discard any changes you have made and exit the Setup. Press the <Esc> key to exit the setup without saving your changes.
Enter	The <Enter> key allows you to display or change the setup option listed for a particular setup item. The <Enter> key can also allow you to display the setup sub- screens.

5.3 Main Menu

When the first time you enter the Setup Utility, you will be in the Main setup screen.You can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.



- **System Date/Time**

Use this option to change the system date and time. Highlight System Date or System Time using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Enter> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

5.4 Advanced Menu

- **Launch PXE OpROM**

Use this item to enable or disable the Boot ROM function of the onboard LAN chip when the system boots up.

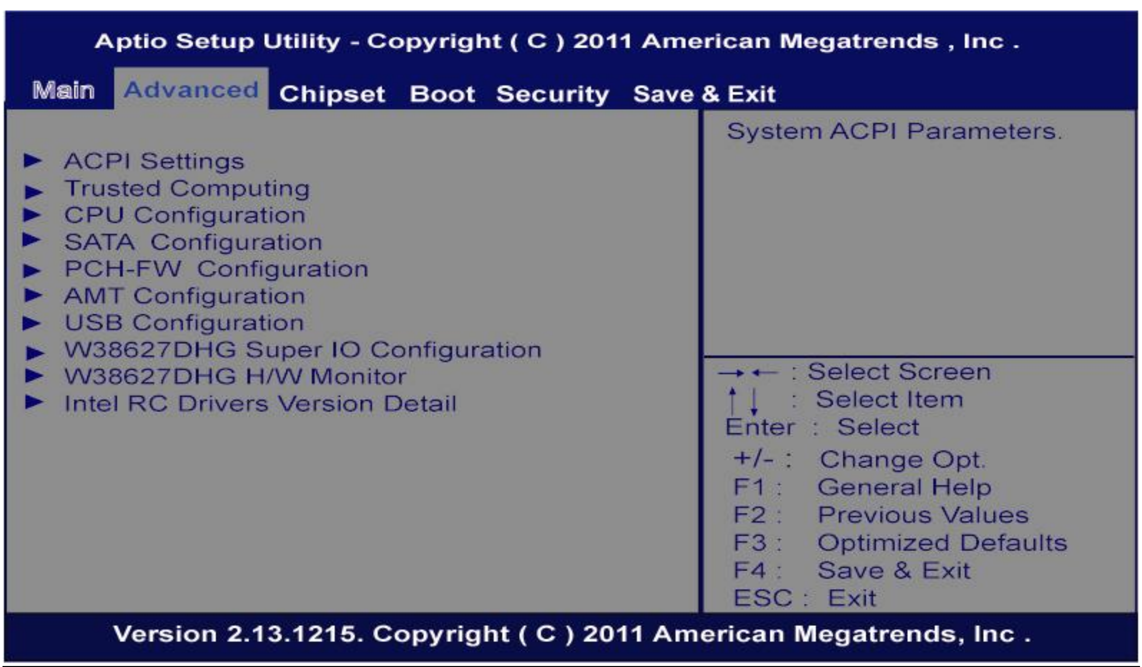
- **Launch Storage OpROM**

This item can set enable or disable the storage device option ROM with CF device.

The Advanced menu also allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:

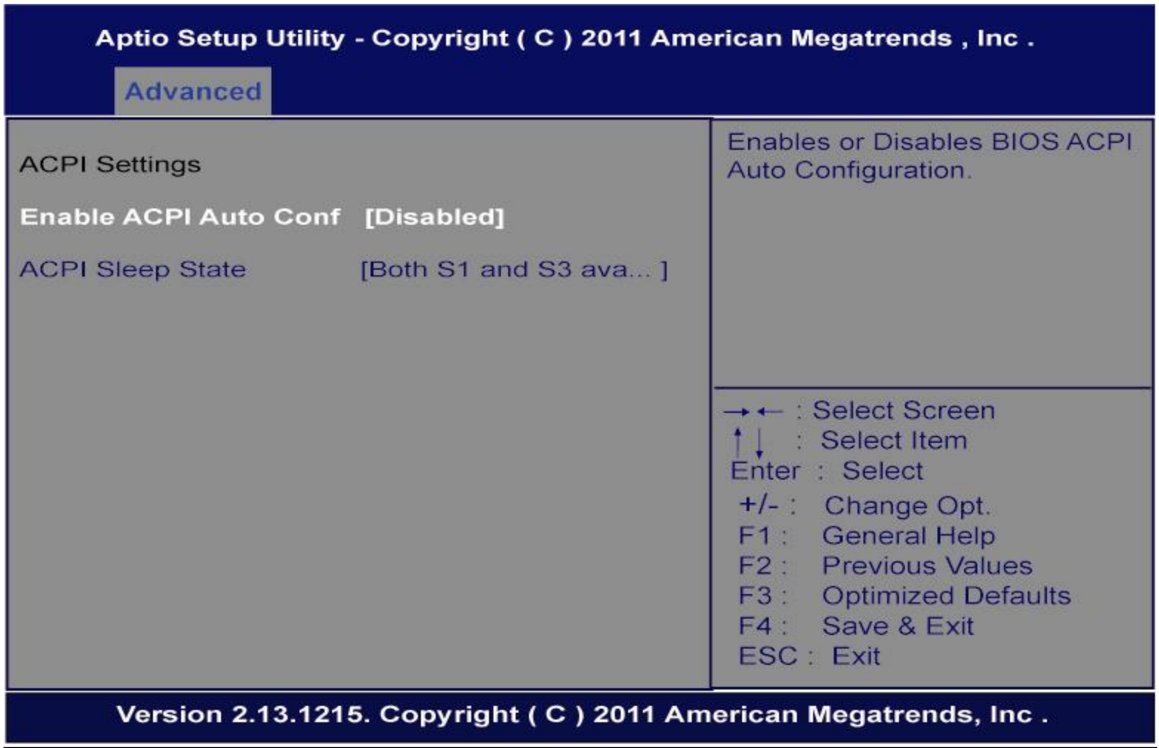
- **ACPI Settings**
- **Trusted Computing**
- **CPU Configuration**
- **SATA Configuration**
- **PCH-FW Configuration**
- **AMT Configuration**
- **USB Configuration**
- **W83627DHG Super IO Configuration**
- **W83627DHG H/W Monitor**
- **Intel RC Drivers Version Detail**

For items marked with "►", please press <Enter> for more options.



- **ACPI Settings**

You can use this screen to select options for the ACPI Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.

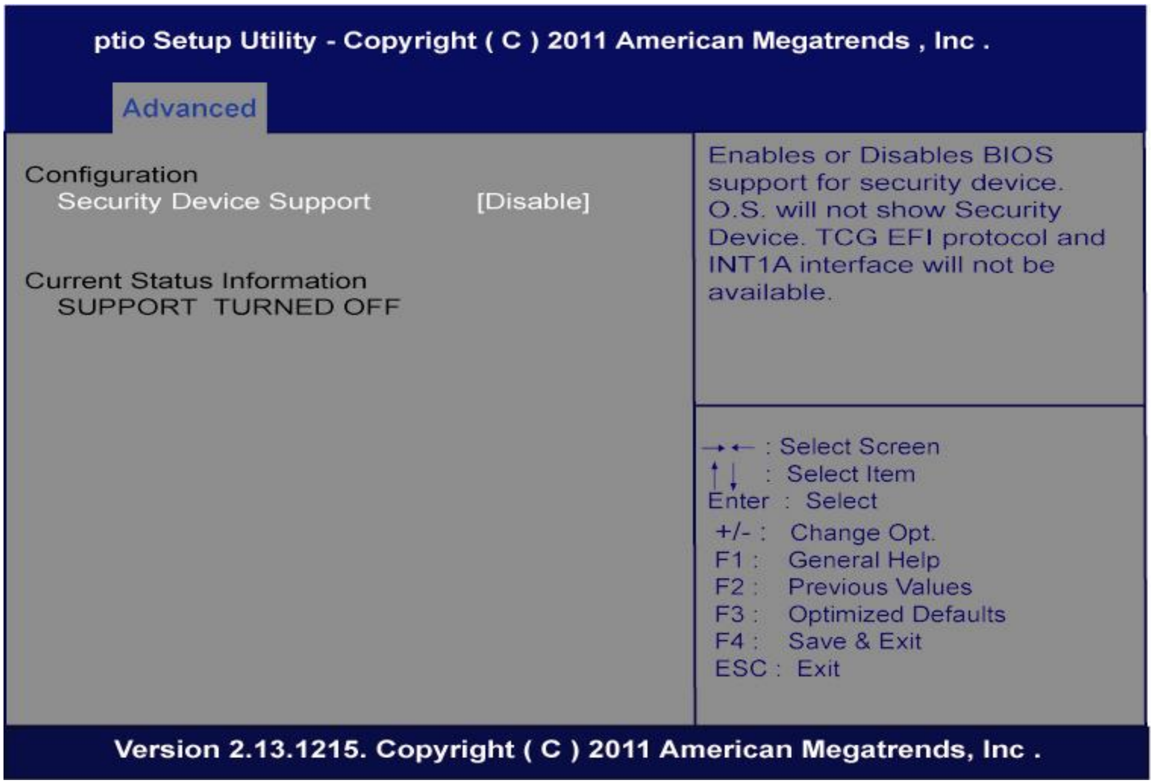


- ACPI Sleep State

  Allow you to select the Advanced Configuration and Power Interface (ACPI) state to be used for system suspend. Here are the options for your selection, S1 (CPU Stop Clock), S3 (Suspend to RAM) and Suspend Disable

- **Trusted Computing**

You can use this screen to select options for the Trusted Computing, and change the value of the selected option. A description of the selected item appears on the right side of the screen.

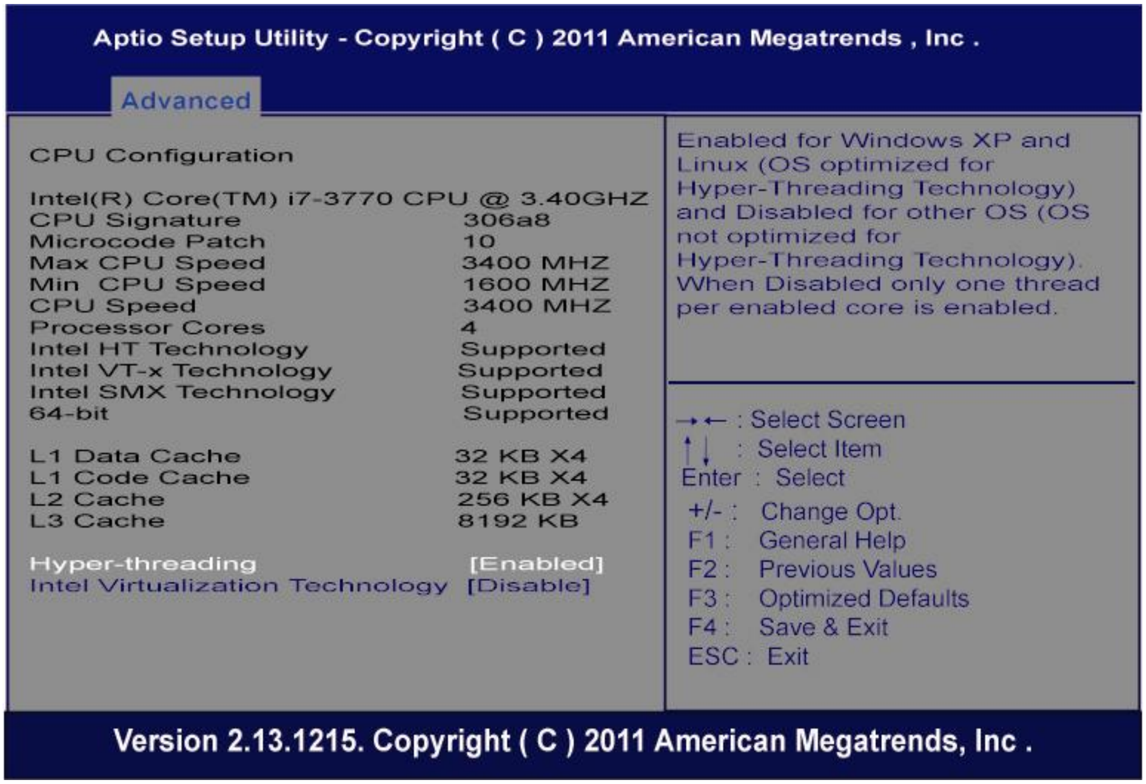


- TPM SUPPORT

  Use this item to control the Trusted Platform Module (TPM) function.

- **CPU Configuration**

This screen shows the CPU Configuration, and you can change the value of the selected option.



- Hyper-threading

  This item can set enable or disable for support Hyper-threading Technology.

- Active Processor Cores

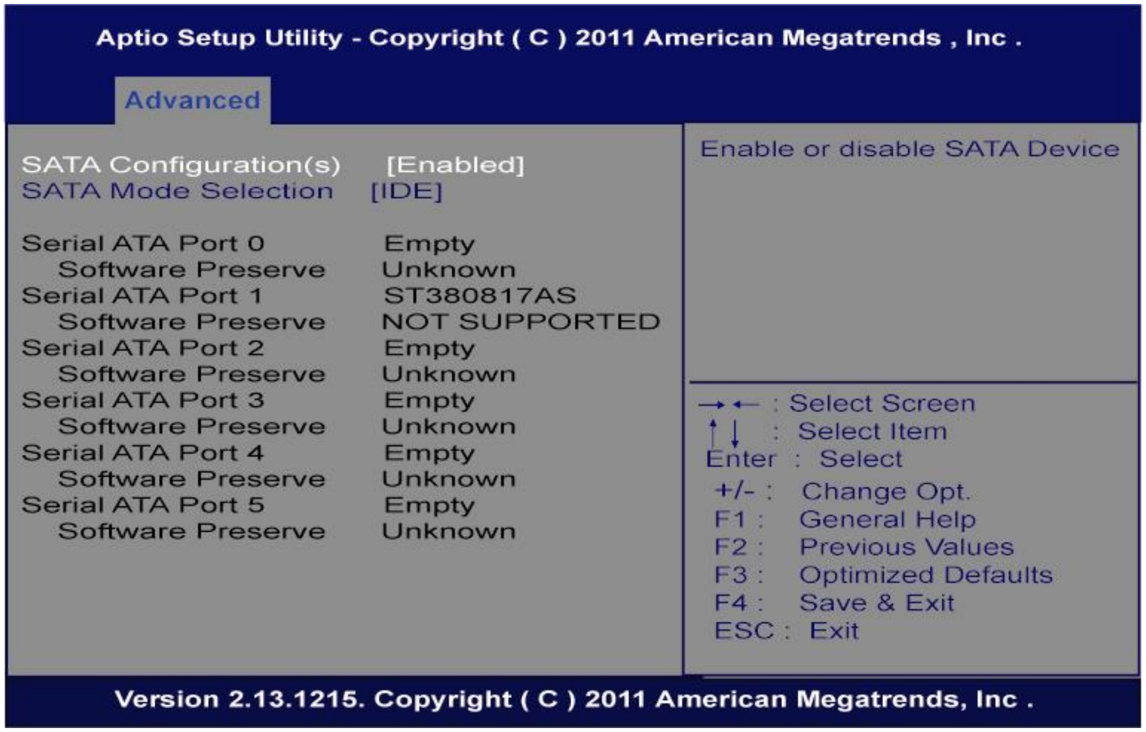
  This feature controls the number of cores to enable in each processor package.

- Intel Virtualization Technology

  Allows a hardware platform to run multiple operating systems separately and simultaneously, enabling one system to virtually function as several systems.

- **SATA Configuration**

You can use this screen to select options for the SATA Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



- SATA Mode

  Use this item to choose the SATA operation mode. Here are the options for your selection, IDE Mode, AHCI Mode and RAID Mode.

- Serial-ATA Controller 0

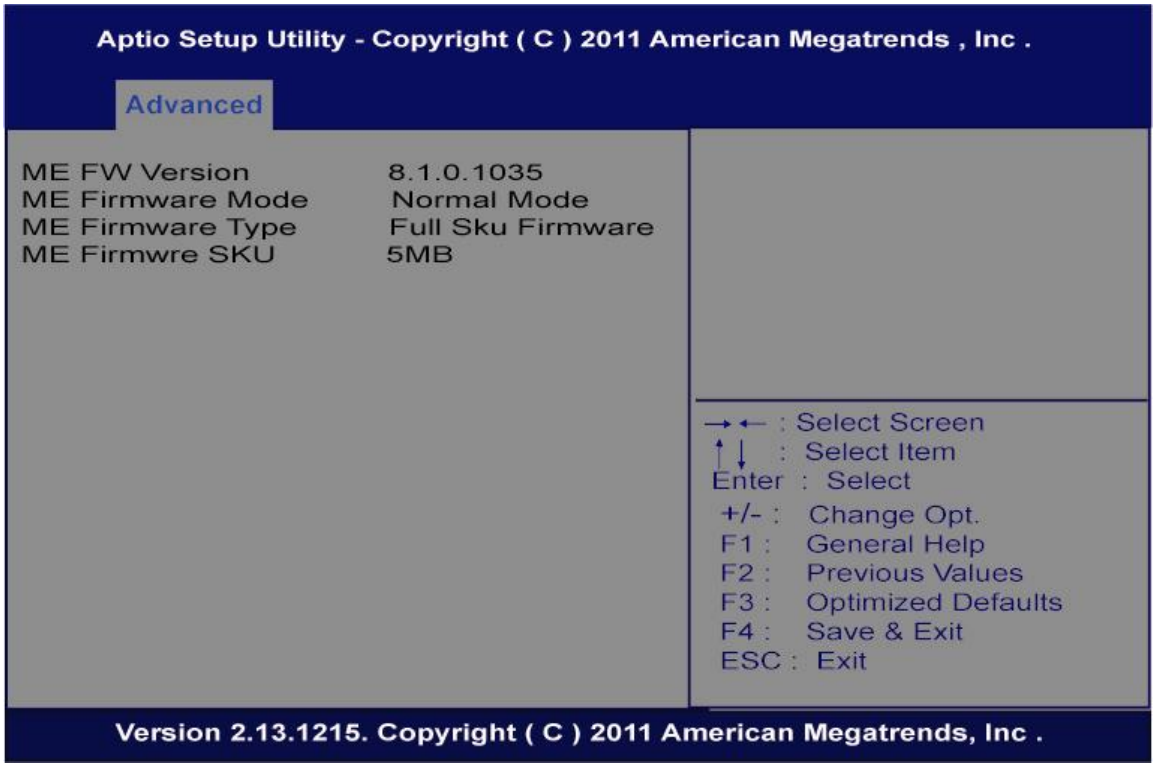
  Use this item to control the onboard SATA controller. Here are the options for your selection, Compatible, Enhanced and Disable.

- Serial-ATA Controller 1

  Use this item to control the onboard SATA controller. Here are the options for your selection, Enhanced and Disabled.

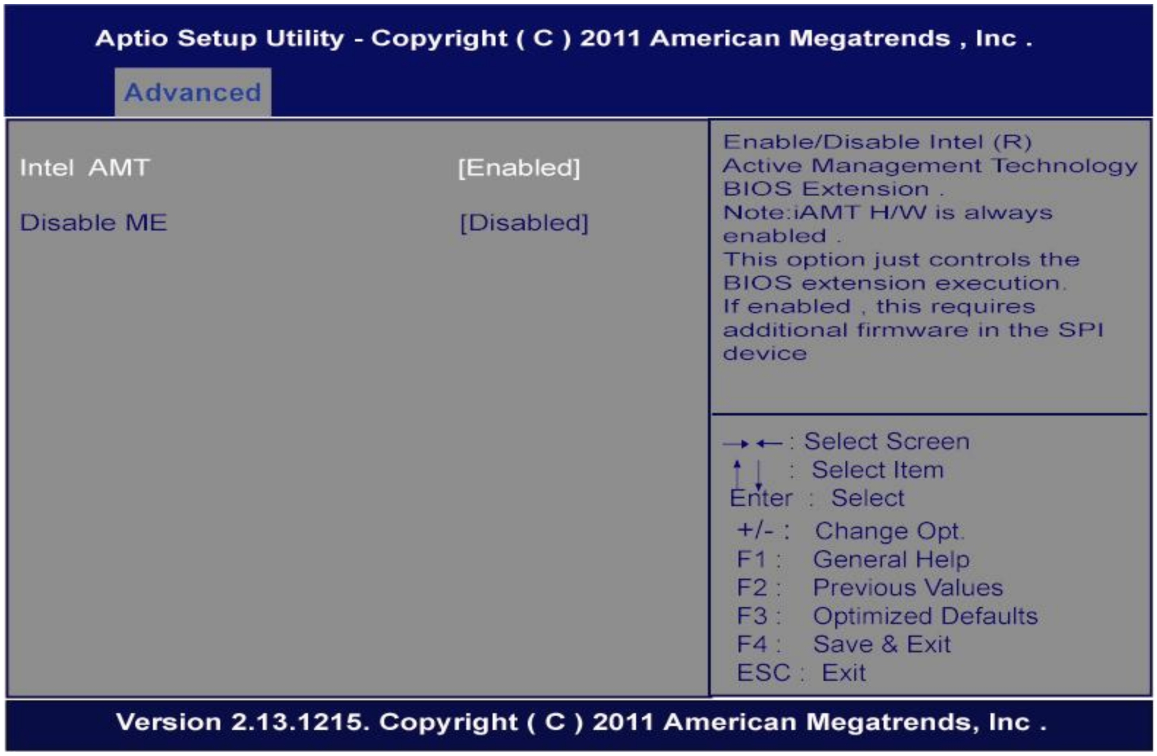
- **PCH-FW Configuration**

The Intel IGD SWSCI OpRegion allows users to change the integrated graphic device settings.



- **AMT Configuration**

You can use this screen to select options for the Intel AMT Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



- AMT

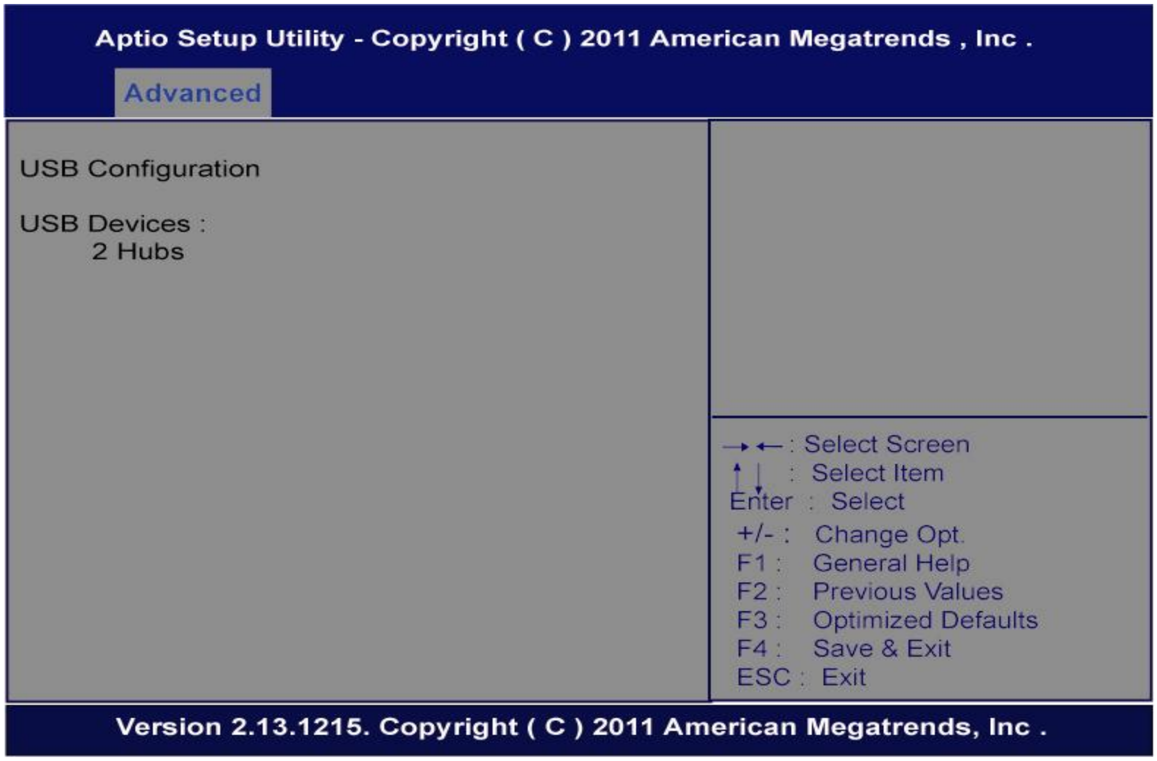
  You can enable this item to support AMT (active management technology) function to follow up the procedure for the access to AMI program screen.

- Unconfigure AMT/ME

  Use this item to unconfigure the AMT/ME settings.

- **USB Configuration**

You can use this screen to select options for the USB Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



➢ EHCI Hand-off

This is a workaround for OSes without EHCI hand-off support.

The EHCI ownership change should be claimed by EHCI driver.

- **Super IO Configuration**

You can use this screen to select options for the Super IO Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen. For items marked with "►", please press <Enter> for more options.



- Floppy Disk Controller Configuration

  You can use this screen to select options for the Floppy Configuration, and change the value of the selected option.

- Serial Port 1 Configuration

  This option specifies the base I/O port address and Interrupt Request address of serial port 1. The Optimal setting is 2F8/IRQ3.

- Serial Port 2 Configuration

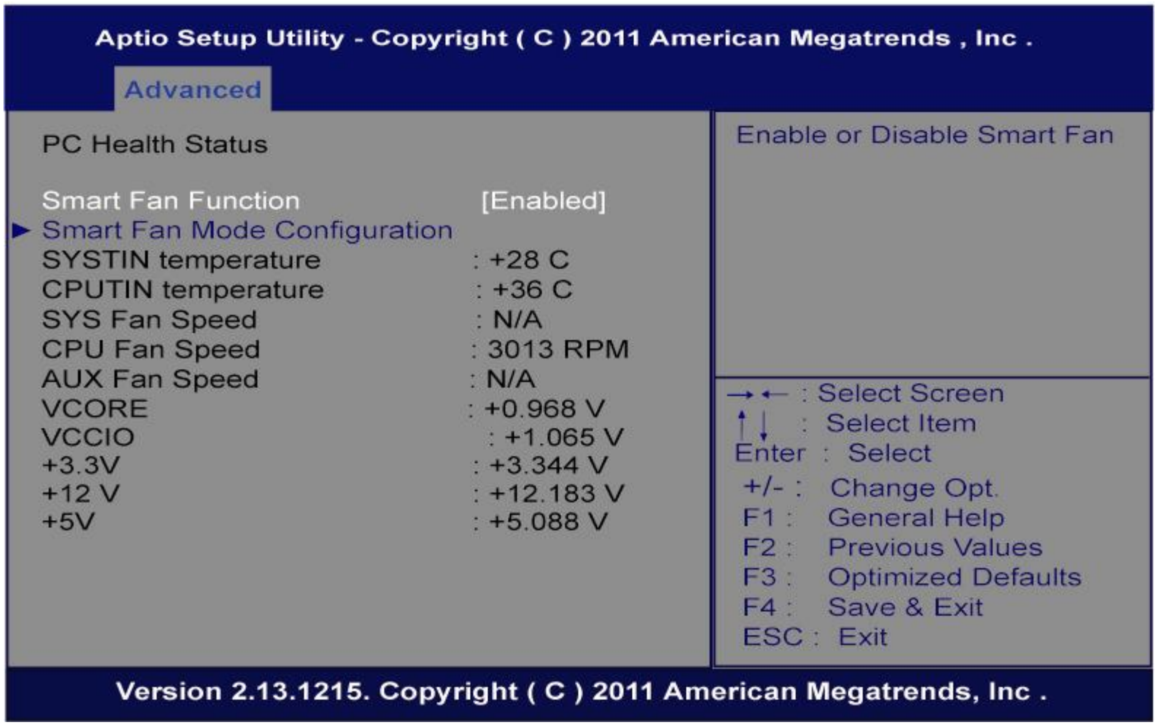
  This option specifies the base I/O port address and Interrupt Request address of serial port 1. The Optimal setting is 3F8/IRQ4.

- Parallel Port Configuration

  This item allows you to determine the Parallel Port Mode and I/O address for onboard parallel port.

- **H/W Monitor**

This screen shows the Hardware Health Configuration, and a description of the selected item appears on the right side of the screen



- Smart Fan Function

  This item can enable or disable the Smart Fan function.

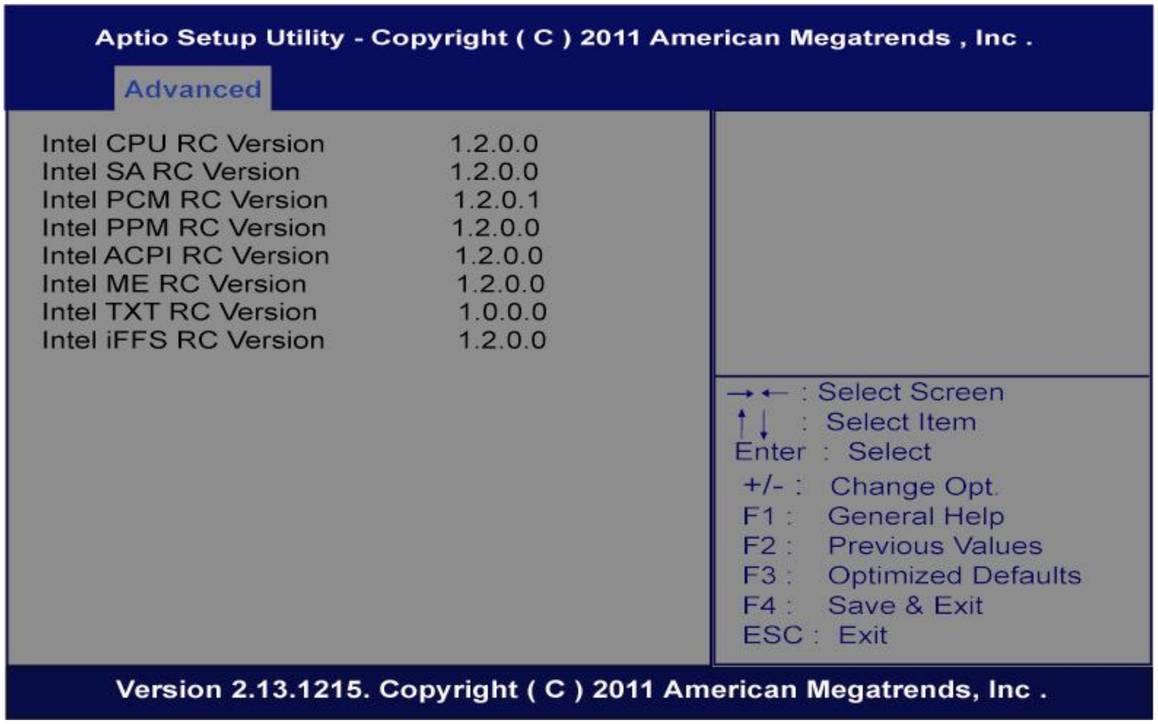
- Smart Fan Mode Configuration

  This item can adjust the CPU/System/Auxiliary Fan speed automatically in accordance with the current CPU/System temperature that can prevent the system overheating.

  The Auxiliary Fan also in accordance with current CPU temperature.

  There are these options Manual Mode and Thermal Cruise Mode.

- **Intel RC Drivers Version Detail**

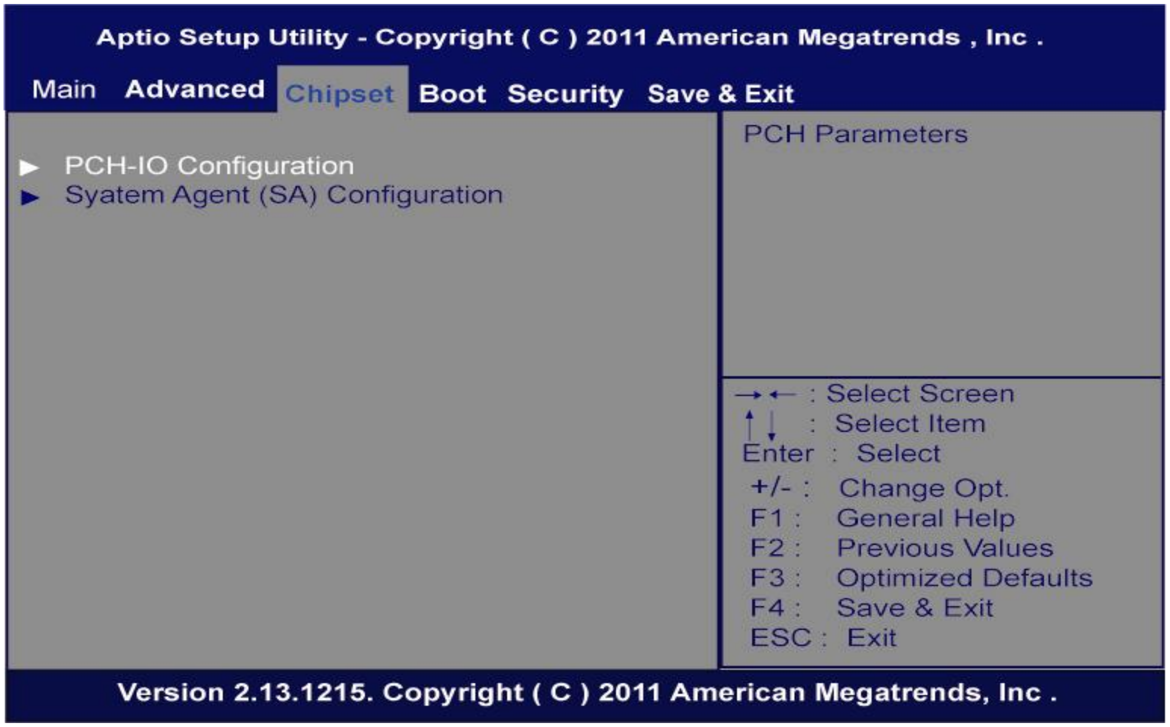


5.5 Chipset Menu

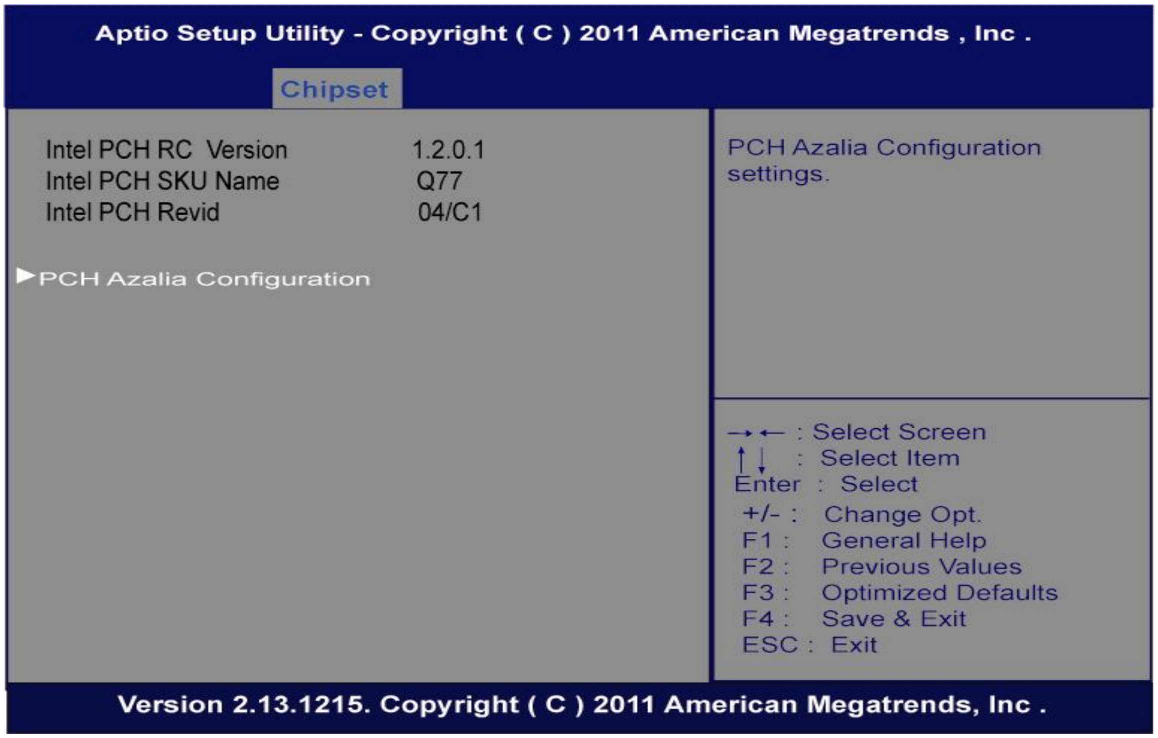
The Chipset menu allows users to change the advanced chipset settings. You can select any of the items in the left frame of the screen to go to the sub menus:

- **PCH-IO Configuration**
- **System Agent (SA) Configuration**

For items marked with “►”, please press <Enter> for more options.



- **PCH-IO Configuration**

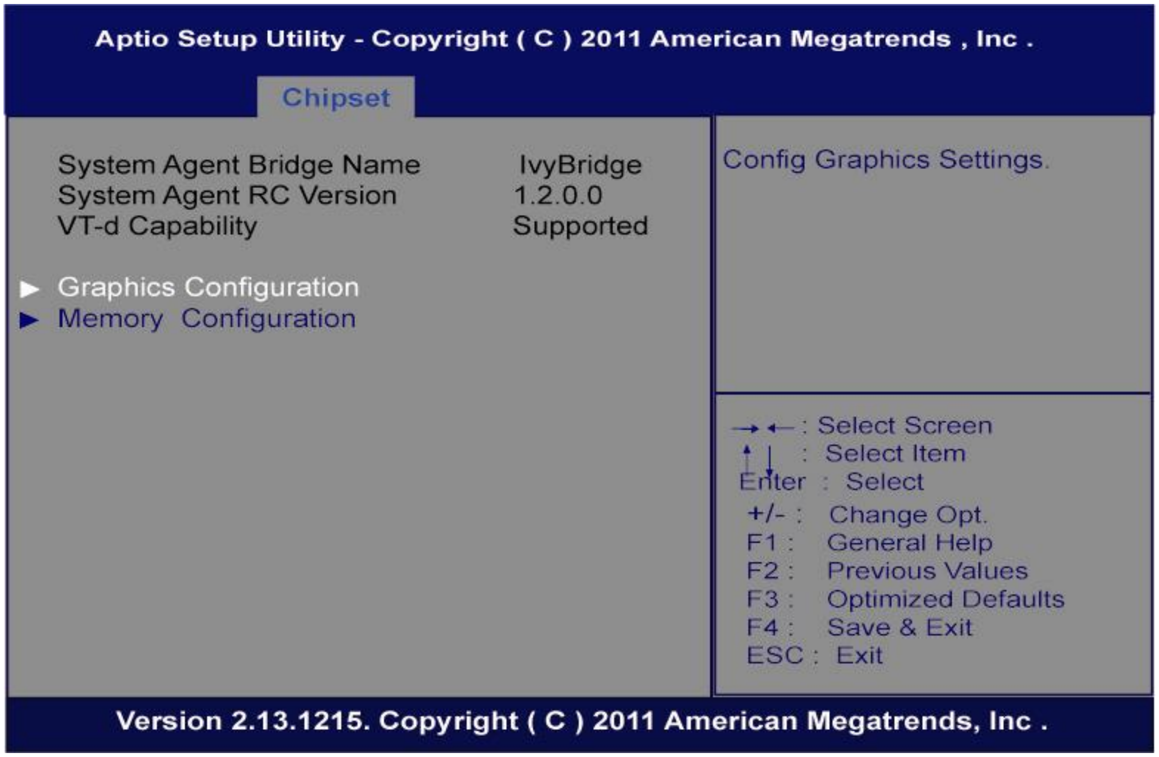


➢ USB Configuration

You can use this item to set the USB Configuration.

- **System Agent (SA) Configuration**

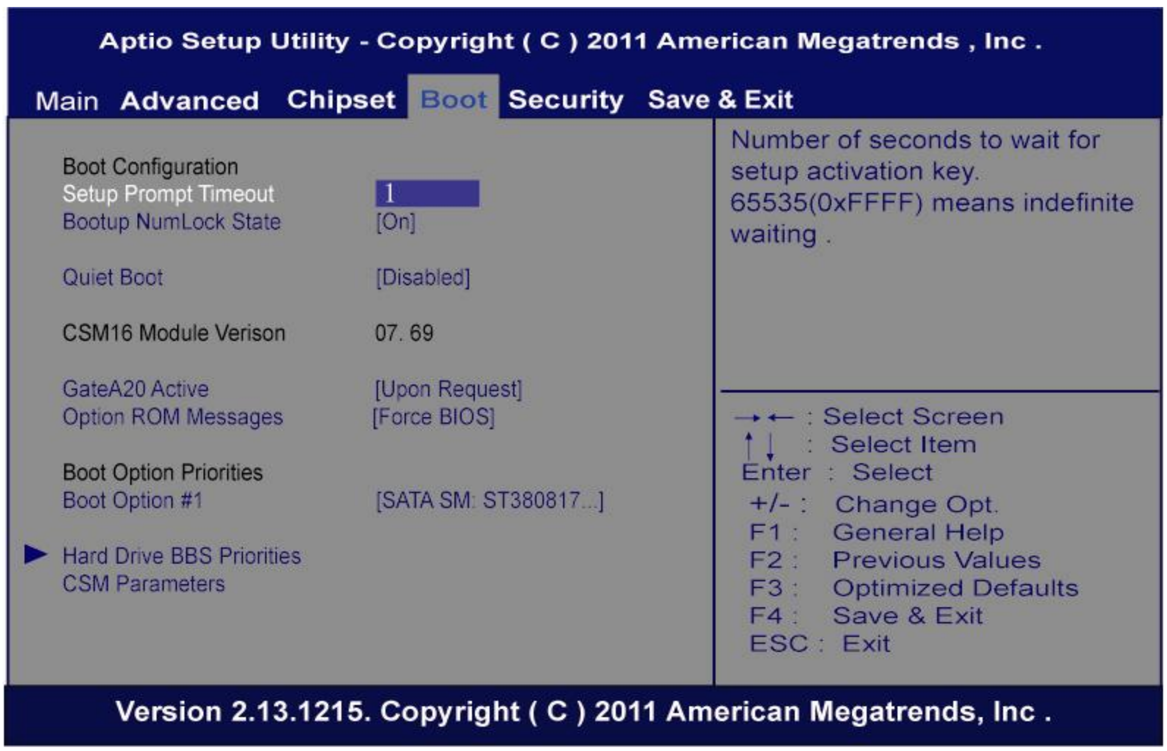
It is strongly recommended that you do not modify these options unless you are an advanced user.



5.6 Boot Menu

The Boot menu allows users to change boot options of the system. You can select any of the items in the left frame of the screen to go to the sub menus:

- **Setup Prompt Timeout**
- **Bootup NumLock State**
- **Quet Boot**
- **CSM16 Module Verison**
- **GateA20 Active**
- **Boot Option Priorities**



- ➢ Quite Boot

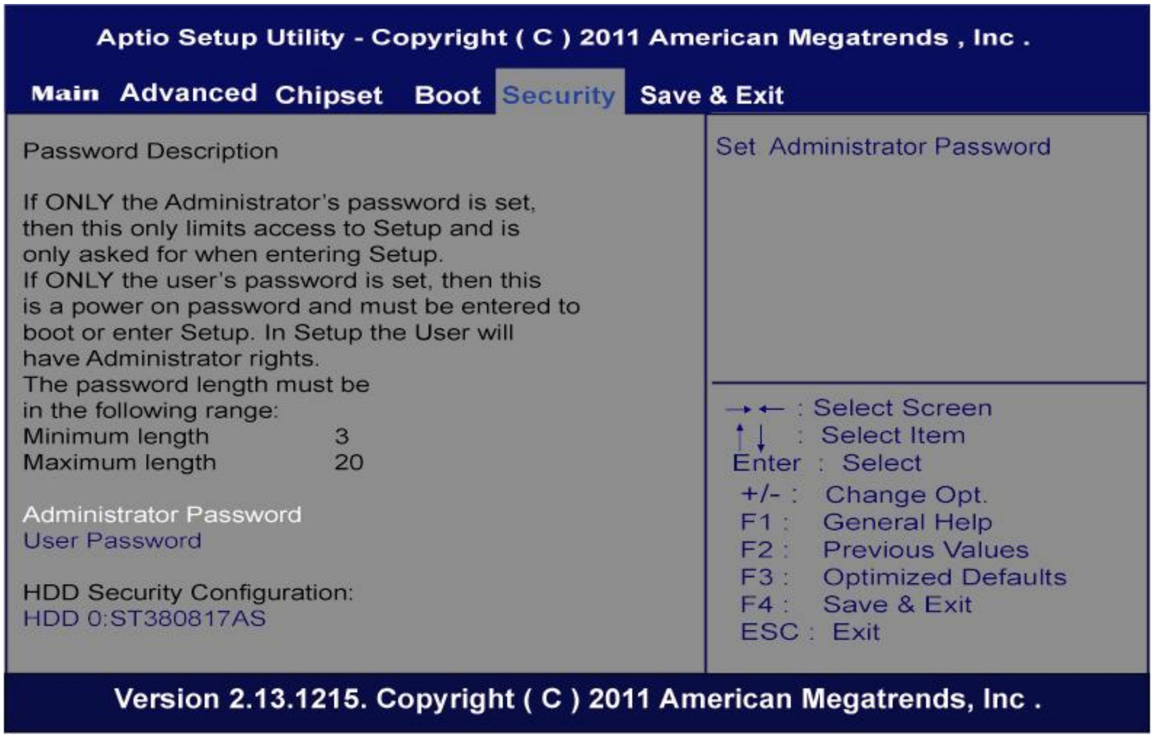
  Use this item to enable or disable the Quite Boot state. The default setting is disabling.

- ➢ Bootup NumLock State

  Use this item to select the power-on state for the NumLock. The default setting is *on*.

5.7 Security Menu

The Security menu allows users to change the security settings for the system.



- Administrator Password

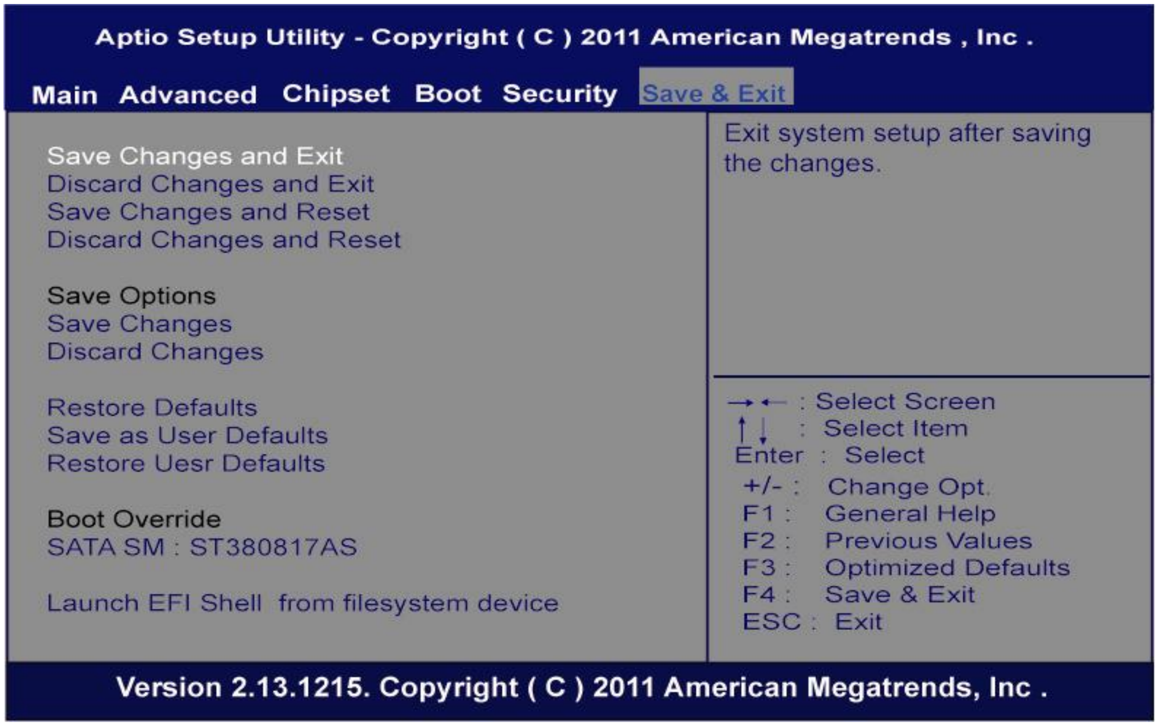
  This item indicates whether an administrator password has been set. If the password has been installed, Installed displays. If not, Not Installed displays.

- User Password

  This item indicates whether a user password has been set. If the password has been installed, Installed displays. If not, Not Installed displays.

5.8 Save & Exit Menu

The Save & Exit menu allows users to load your system configuration with optimal or failsafe default values.



- Save Changes and Exit

  When you have completed the system configuration changes, select this option to leave Setup and return to Main Menu. Select *Save Changes and Exit* from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.

- Discard Changes and Exit

  Select this option to quit Setup without making any permanent changes to the system configuration and return to Main Menu. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to discard changes and exit.

- Save Changes and Reset

  When you have completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect. Select *Save Changes and Reset* from the Save & Exit menu and press <Enter>. Select Yes to save changes and reset.

- Discard Changes and Reset

  Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to discard changes and reset.

- Save Changes

  When you have completed the system configuration changes, select this option to save changes. Select *Save Changes* from the Save & Exit menu and press <Enter>. Select Yes to save changes.

- Discard Changes

  Select this option to quit Setup without making any permanent changes to the system configuration. Select Discard Changes from the Save & Exit menu and press <Enter>. Select Yes to discard changes.

- Restore Defaults

  It automatically sets all Setup options to a complete set of default settings when you select this option. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal Setup options if your computer is experiencing system configuration problems. Select Restore Defaults from the save & Exit menu and press <Enter>.

MEMO:

APPENDIX A
WATCHDOG TIMER

Watchdog Timer Setting

After the system stops working for a while, it can be auto-reset by the Watchdog Timer. The integrated Watchdog Timer can be set up in the system reset mode by program.

Using the Watchdog Function

Start

↓

Un-Lock WDT

:O 2E 87 ; Un-lock super I/O

O 2E 87 ; Un-lock super I/O

↓

Set WDT Function

O 2E 2D

O 2F 20

Select Logic device

O 2E 07

O 2F 08

↓

Activate WDT

:O 2E 30

O 2F 01

Set Second or Minute

O 2E F5

O 2F N N=00 or 08(See below table)

↓

Set base timer

:O 2E F6

O 2F M=00, 01, 02 FF(Hex) ,Value=0 to 255

↓

WDT counting

re-set timer :O 2E F6

O 2F M ; M=00,01,02,…FF(See below table)

↓

IF No re-set timer : WDT time-out, generate RESET

IF to disable WDT : O 2E 30

O 2F 00; Can be disable at any time

N=00

M= 00h: Time-out Disable

01h: Time-out occurs after 1 second

02h: Time-out occurs after 2 second

03h: Time-out occurs after 3 second

………………………......................................

FFh: Time-out occurs after 255 second

N=08

M= 00h: Time-out Disable

01h: Time-out occurs after 1 minute

02h: Time-out occurs after 2 minutes

03h: Time-out occurs after 3 minutes

FFh: Time-out occurs after 255 minutes

APPENDIX B
PCI IRQ ROUTING

PICMG® PCI IRQ Routing

Device	ID	Slot	Int
PCI Slot 0	31	0	BCDA
PCI Slot 1	30	1	CDAB
PCI Slot 2	29	2	DABC
PCI Slot 3	28	3	ABCD

MEMO:

APPENDIX C CONFIGURING SATA FOR RAID FUNCTION

Configuring SATA Hard Drive(s) for RAID Function (Controller: Intel®Q77)

Please follow up the steps below to configure SATA hard drive(s):

(1) Install SATA hard drive(s) in your system.

(2) Enter the BIOS Setup to configure SATA controller mode and boot sequence.

(3) Configure RAID by the RAID BIOS.

(4) Create a floppy disk for the SATA controller driver.

(5) Install the SATA controller driver during the OS installation.

Before you begin the SATA configuration, please prepare:

(a) Two SATA hard drives (to ensure optimal performance, it is recommended that you use two hard drives with identical model and capacity). If you do not want to create RAID with the SATA controller, you may prepare only one hard drive.

(b) An empty formatted floppy disk

(c) Windows XP setup disk

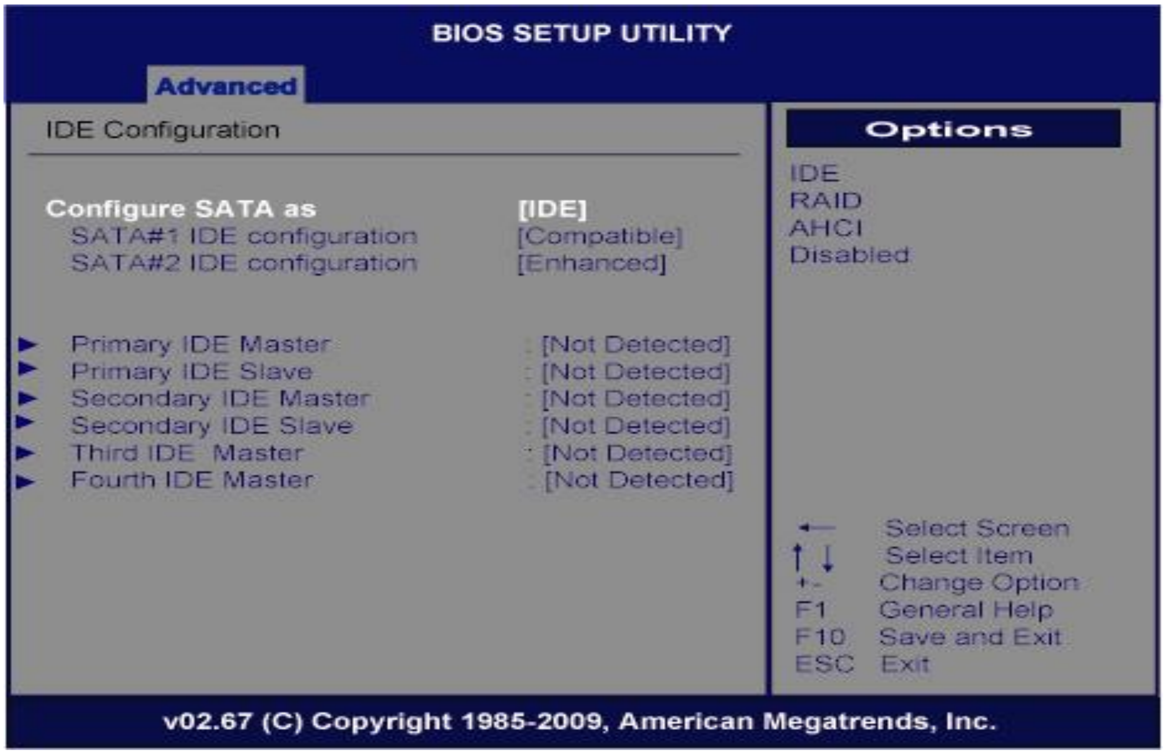
1. **Installing SATA hard drive(s) in your system**

Connect one end of the SATA signal cable to the rear of the SATA hard drive, and the other end to available SATA port(s) on the board. Then, connect the power connector of power supply to the hard drive.

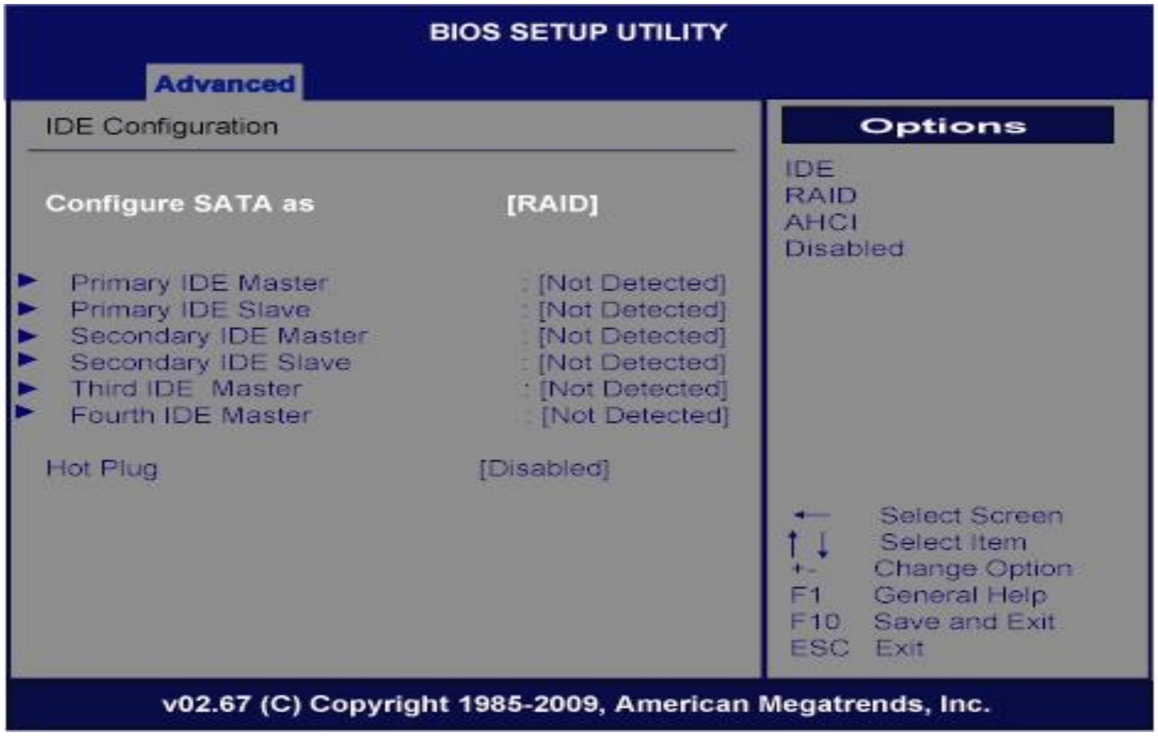
2. Configuring SATA controller mode and boot sequence by the BIOS Setup

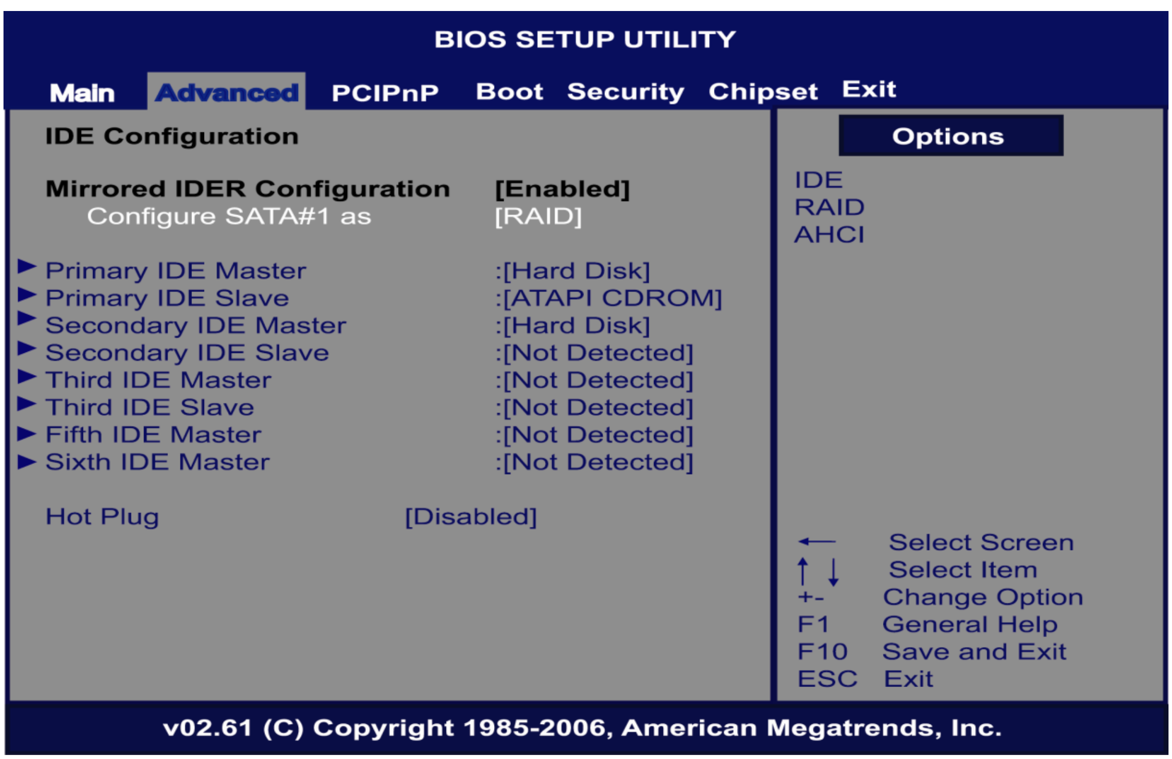
You have to make sure whether the SATA controller is configured correctly by system BIOS Setup and set up BIOS boot sequence for the SATA hard drive(s)

(2)-1-1 Turn on your system, and then press the Del button to enter BIOS Setup during running POST (Power-On Self Test). If you want to create RAID, just go to the Advanced Settings menu/IDE configuration, select the Configure SATA#1 as, and press <Enter> for more options.

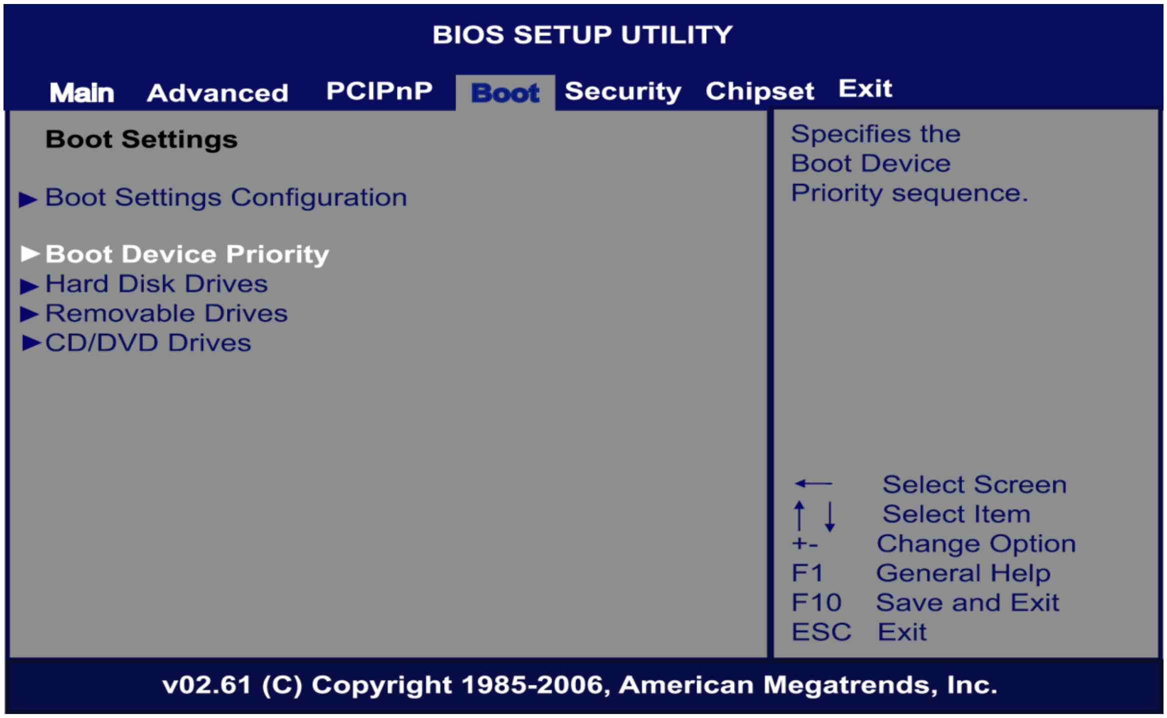


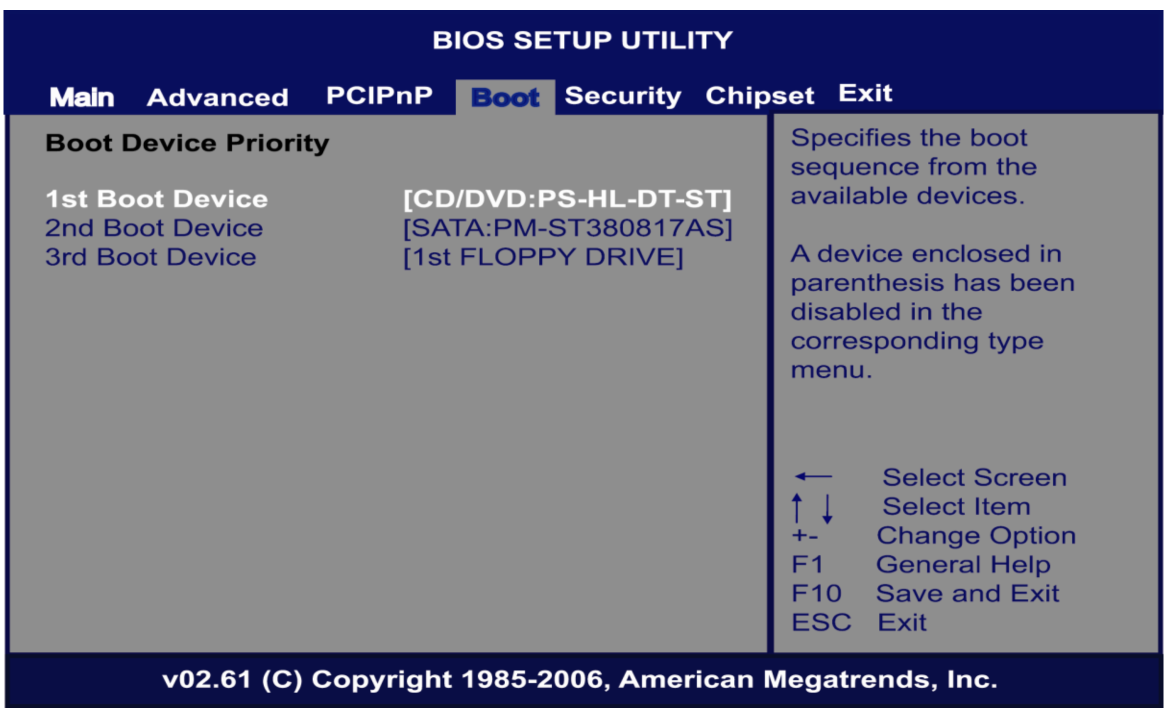
(2)-1-2 A list of options appears, please select RAID.





(2)-2 Set CDROM for First Boot Device under the Boot Settings menu to boot CD-ROM after system restarts.





(2)-3 Save and exit the BIOS Setup.

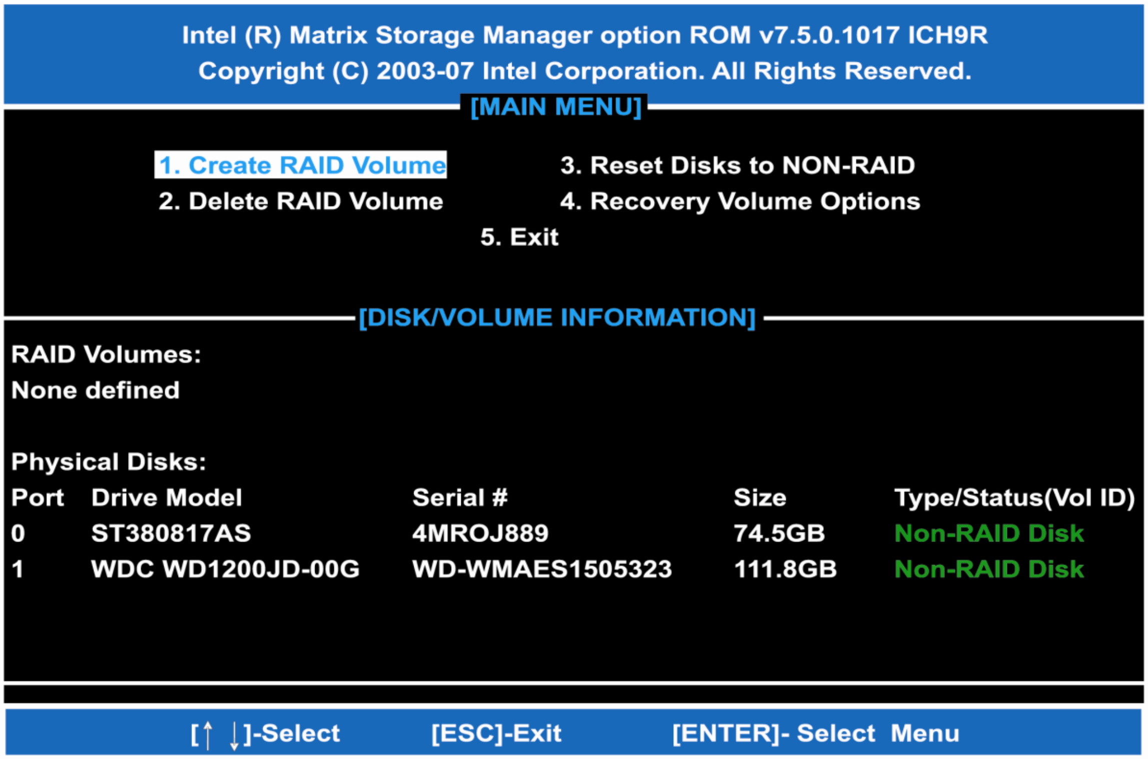
(3) Configuring RAID by the RAID BIOS

Enter the RAID BIOS setup utility to configure a RAID array. Skip this step and proceed to Section 4 if you do not want to create a RAID.

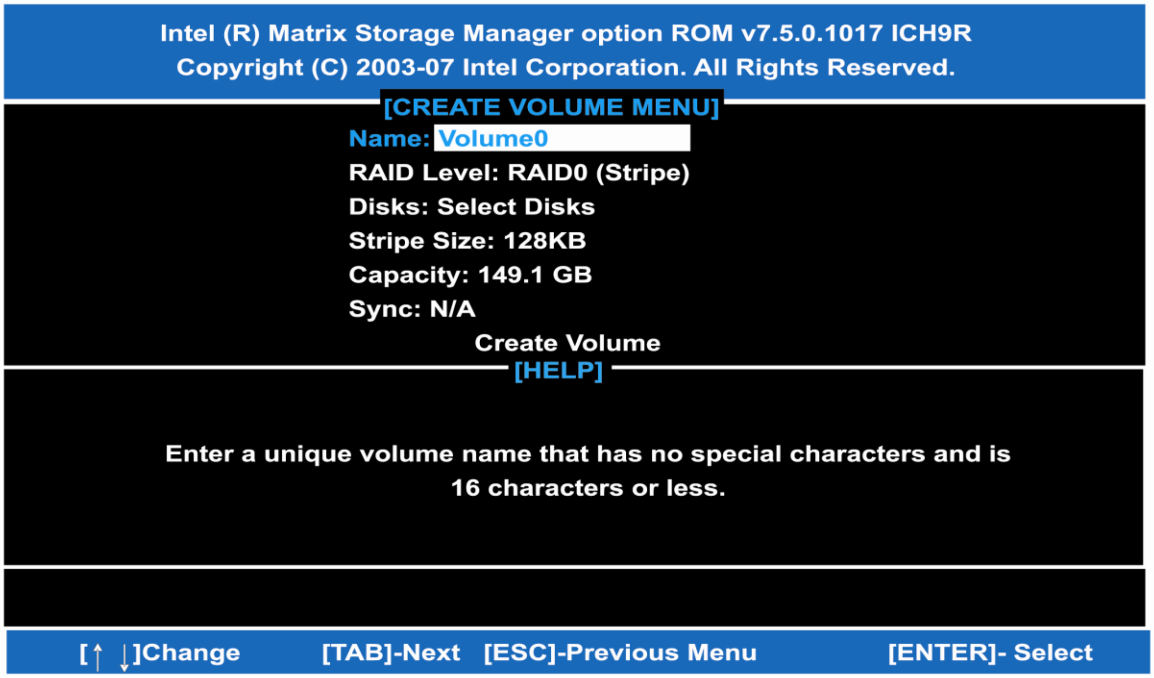
(3)-1 After the POST memory testing and before the operating system booting, a message "*Press* <Ctrl-I> *to enter* Configuration Utility" shows up, accordingly, press <CTRL+ I> to enter the RAID BIOS setup utility.



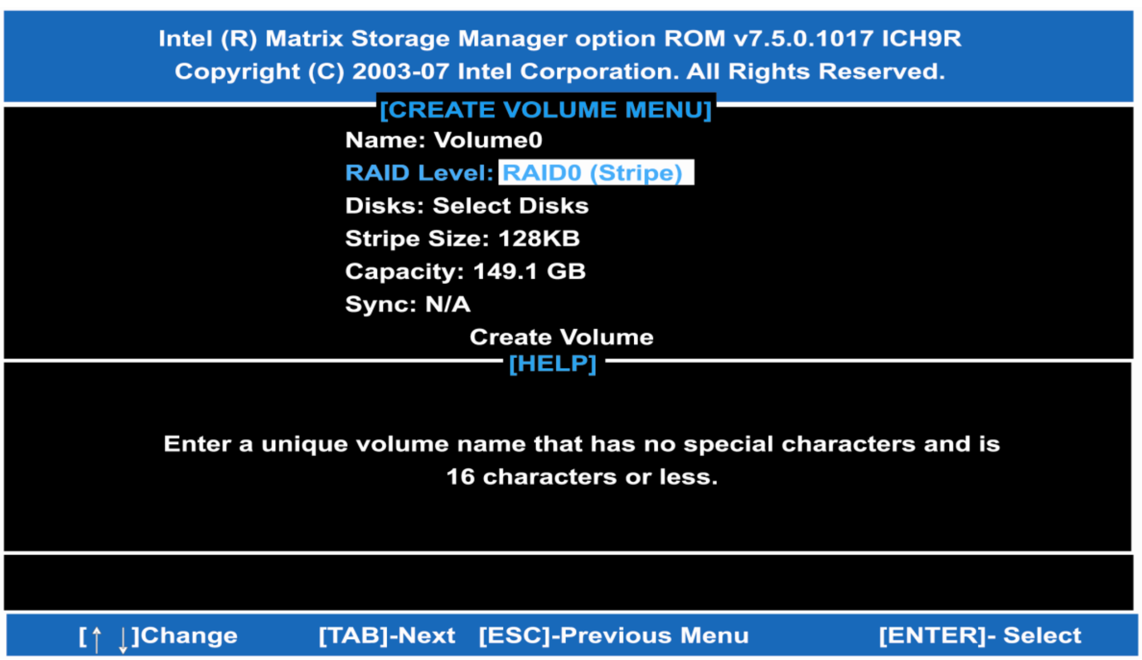
(3)-2 After you press <CTRL+ I>, the Create RAID Volume screen will appear. If you want to create a RAID array, select the Create RAID Volume option in the Main Menu and press ENTER.



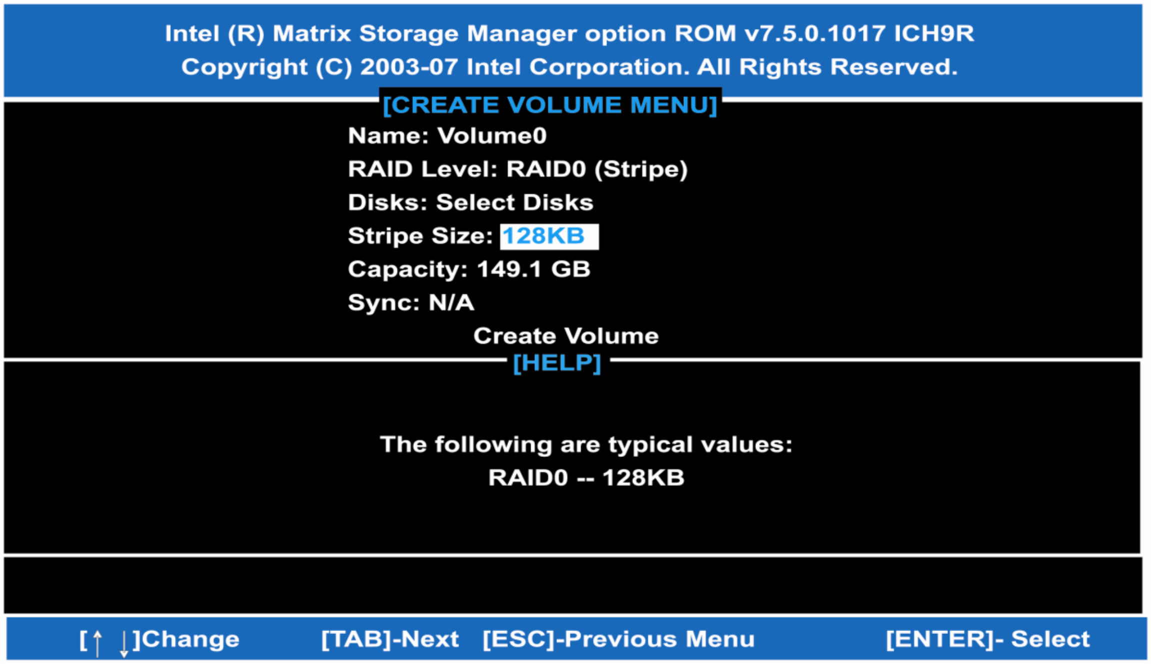
(3)-3-1 After entering the CREATE VOLUME MENU screen, you can type the disk array name with 1~16 letters (letters cannot be special characters) in the item "Name".



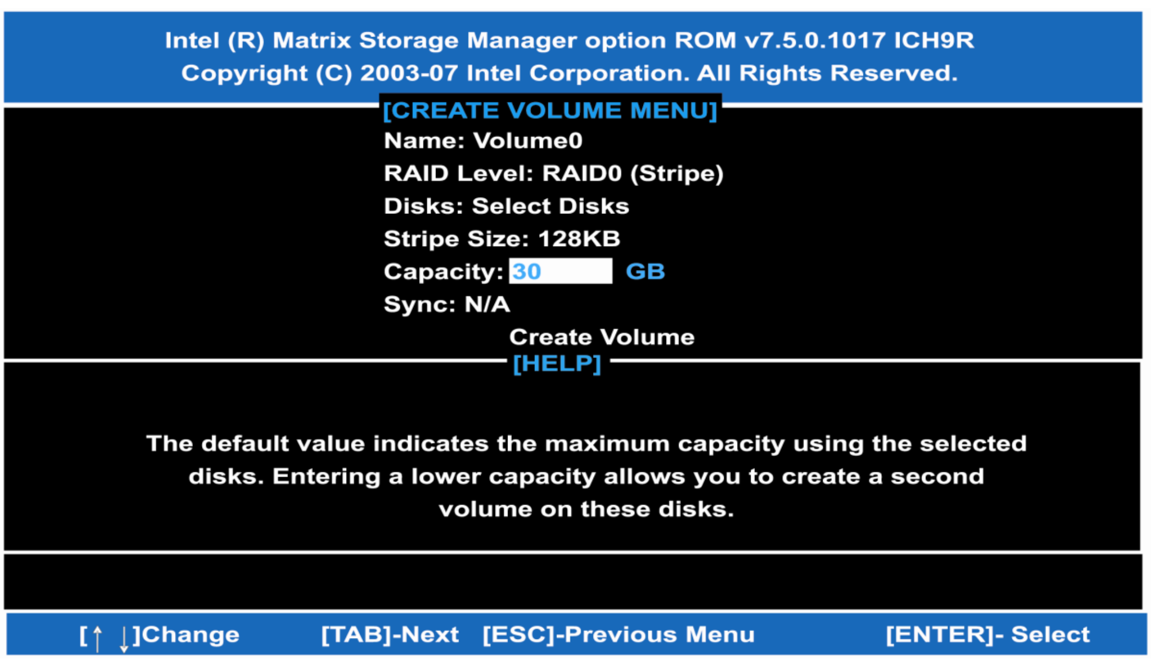
(3)-3-2 When finished, press ENTER to select a RAID level. There are three RAID levels, RAID0, RAID1 and RAID5 & RAID10. Select a RAID level and press ENTER.



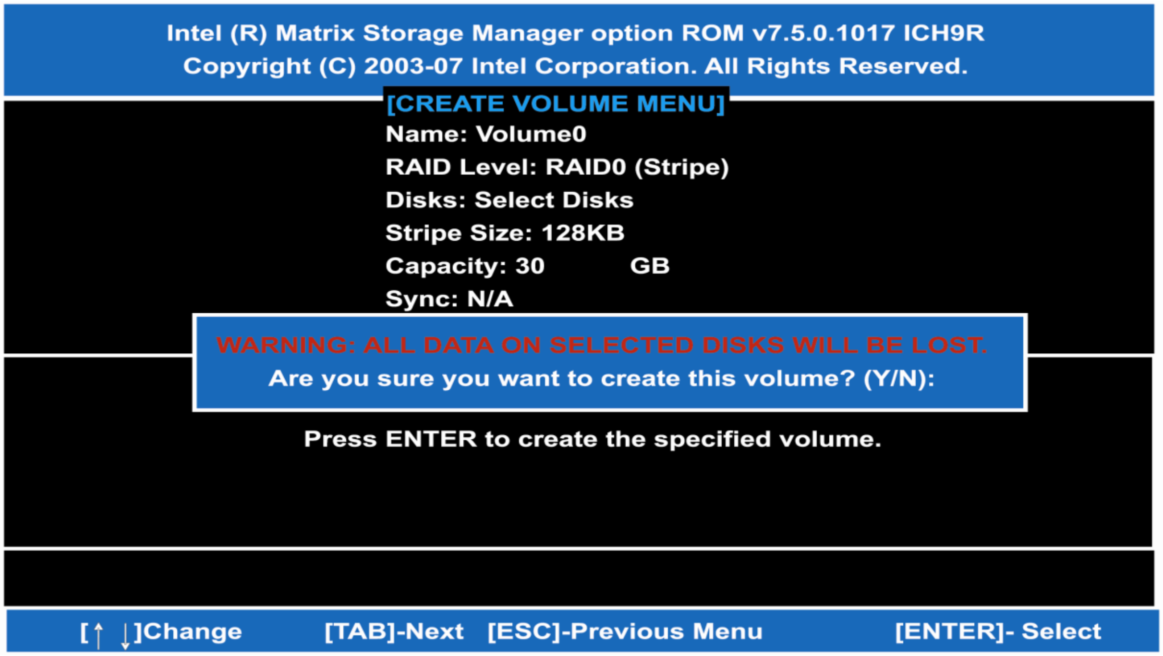
(3)-4 Set the stripe block size. The *KB* is the standard unit of stripe block size. The stripe block size can be 4KB to 128KB. After the setting, press ENTER for the array capacity.



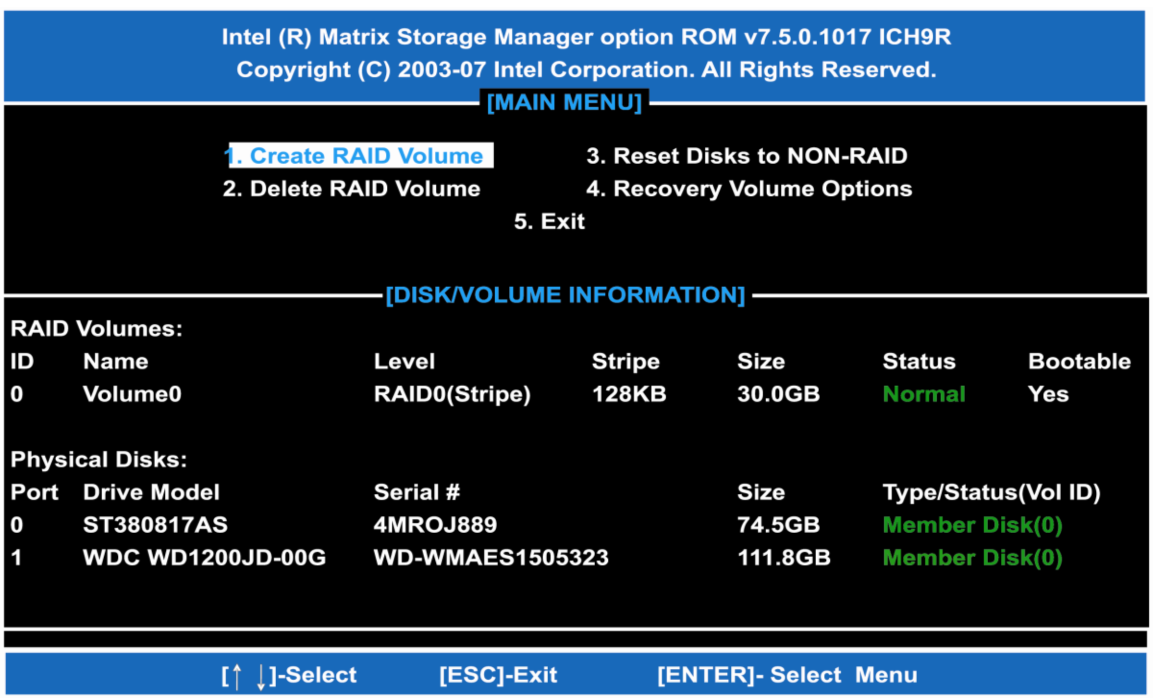
(3)-5 After setting all the items on the menu, select Create Volume and press ENTER to start creating the RAID array.



(3)-6 When prompting the confirmation, press "*Y*" to create this volume, or "*N*" to cancel the creation.

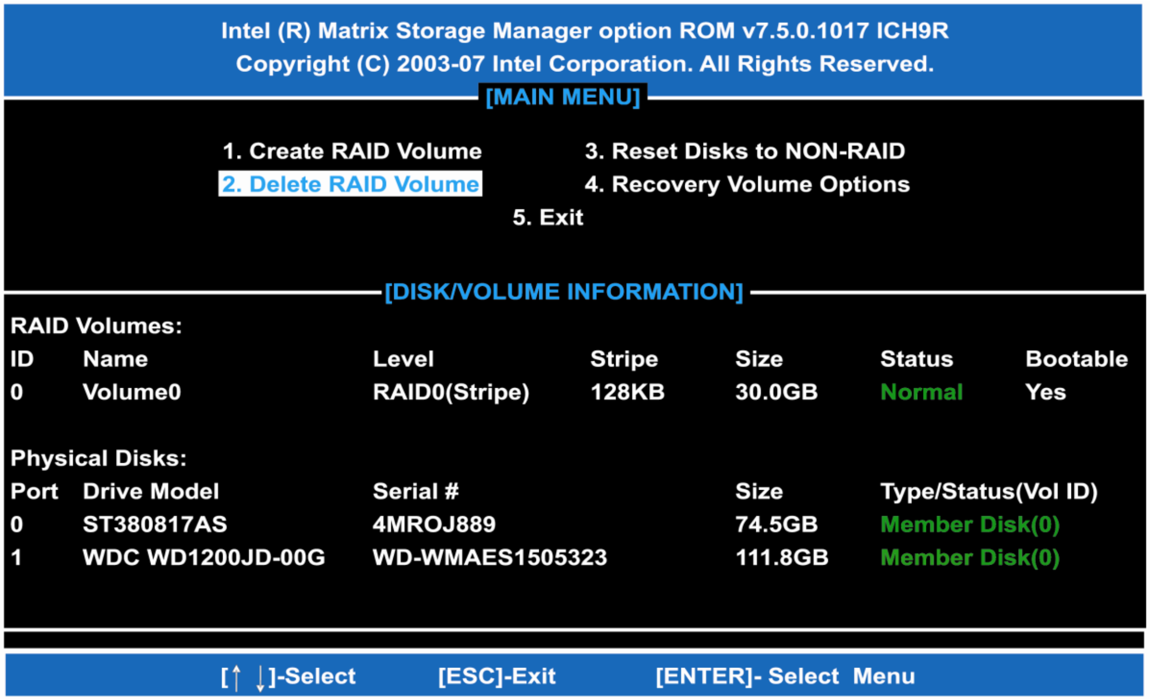


After the creation is completed, you can see detailed information about the RAID Array in the DISK/VOLUME INFORMATION section, including RAID mode, disk block size, disk name, and disk capacity, etc.



- **Delete RAID Volume**

If you want to delete a RAID volume, select the Delete RAID Volume option in Main Menu. Press ENTER and follow on-screen instructions.



Please press [ESC] to exit the RAID BIOS utility.

Now, you can proceed to install a SATA driver controller and the operating system.

(4) Making a SATA Driver Disk

To install the operating system onto a serial ATA hard disk successfully, you need to install the SATA controller driver during the OS installation. Without the driver, the hard disk may not be recognized during the Windows setup process. First of all, please format a blank floppy disk. Secondly, follow up these steps below to produce a SATA driver disk.

Users can insert the Driver CD and the formatted blank floppy disk in another system. And then, please copy all of file of the f6flpy32 folder in the Driver CD to a floppy disk.

NOTE: Please copy all of file of the f6flpy64 folder, if installing 64-bit Windows Operating System.

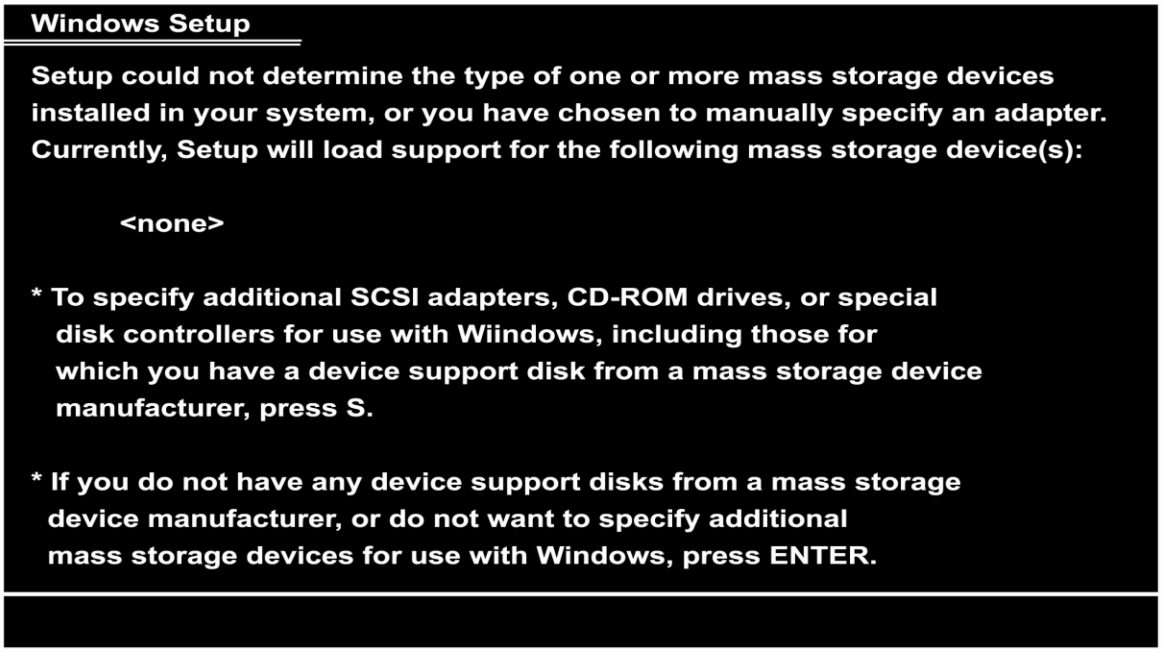
(5) Installing the SATA controller driver during the OS installation

Now, the SATA driver disk is ready, and BIOS settings configured, you can proceed to install Windows 2000/XP onto your SATA hard drive using the SATA driver. Here is an example for Windows XP installation.

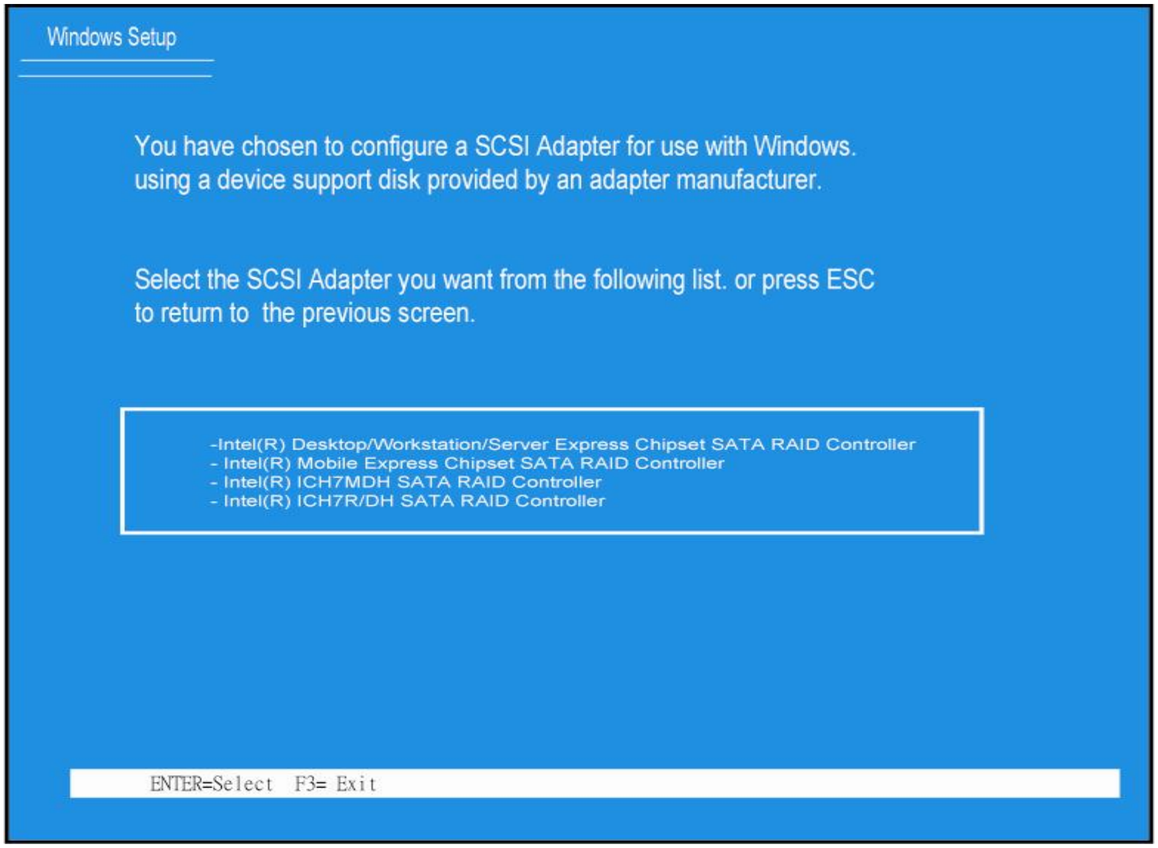
(5)-1 Restart your system to boot the Windows 2000/XP Setup disk, and press F6 button as soon as you see the message "*Press* F6 if you need to install a 3rd party SCSI or RAID driver". After pressing the F6 button, there will be a few moments for some files being loaded before next screen appears.



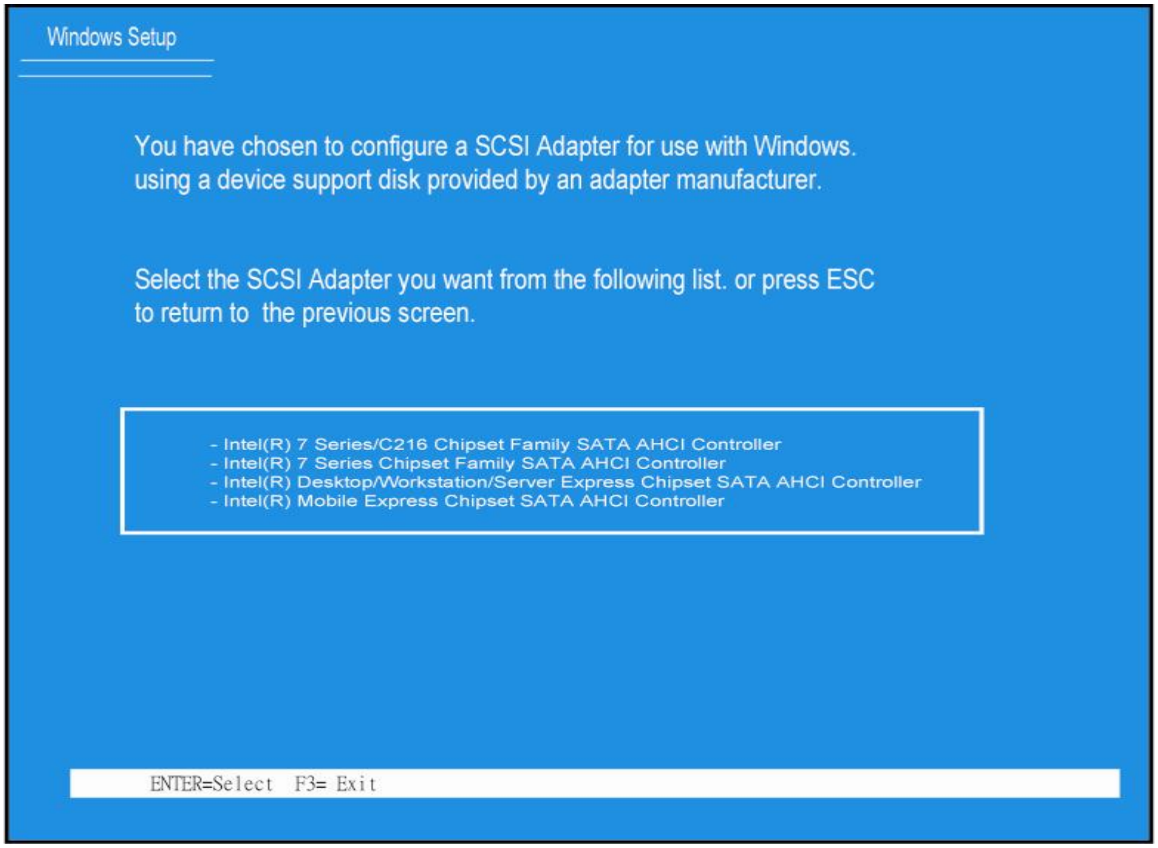
(5)-2 When you see the screen below, insert the floppy disk containing the SATA driver and press "*S*".



(5)-3 If the Setup correctly recognizes the driver of the floppy disk, a controller menu will appear below. Use the ARROW keys to select Intel® Desktop/Workstation/Server Express Chipset SATA Raid Controller and press ENTER. Then it will begin to load the SATA driver from the floppy disk.



Note: If a message on the screen saying that one or some file(s) cannot be found, please check the floppy disk or copy the correct SATA driver again from the driver CD.



Note: If you are installing AHCI, Please select"Intel® 7 Series/C216 Chipset Family SATA AHCI Controller".

APPENDIX D
iAMT SETTINGS

The Intel® Active Management Technology (Intel® iAMT) has decreased a major barrier to IT efficiency that uses built-in platform capabilities and popular third-party management and security applications to allow IT a better discovering, healing, and protection their networked computing assets.

In order to utilize Intel iAMT you must enter the ME BIOS (CTRL + P during system startup), change the ME BIOS password, and then select "Intel® iAMT" as the manageability feature.

D.1 Entering MEBx

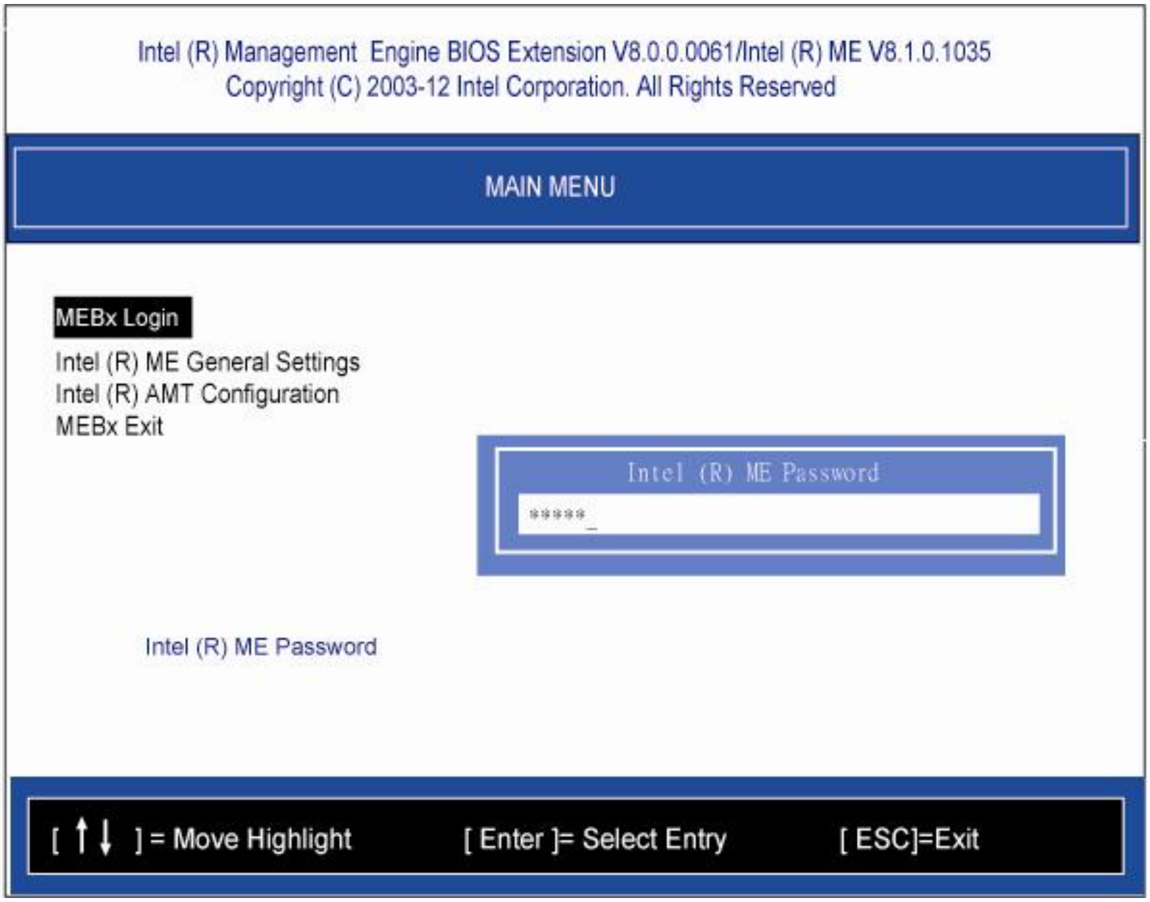
1. You must go to BIOS to start iAMT function.

2. Exit from BIOS after starting iAMT, and press Ctrl+P to enter MEBx Setting.

It is better to press Ctrl+P before the screen popping out.

D.2 Set & Change Password

You will be asked to set a password when first log in. The default password is 'admin'.



1. You will be asked to change the password before setting ME



2. You must confirm your new password while revising. (as Remark 1)

   The new password must contain:

   (example: !!11qqQQ) (default value)Eight characters

- **One upper case**
- **One lower case**
- **One number**
- **One special symbol, such as ！、$ or ；，**
- **(、" , excepted)**

Underline (_) and space are valid characters for password, but they won't make higher complexity.

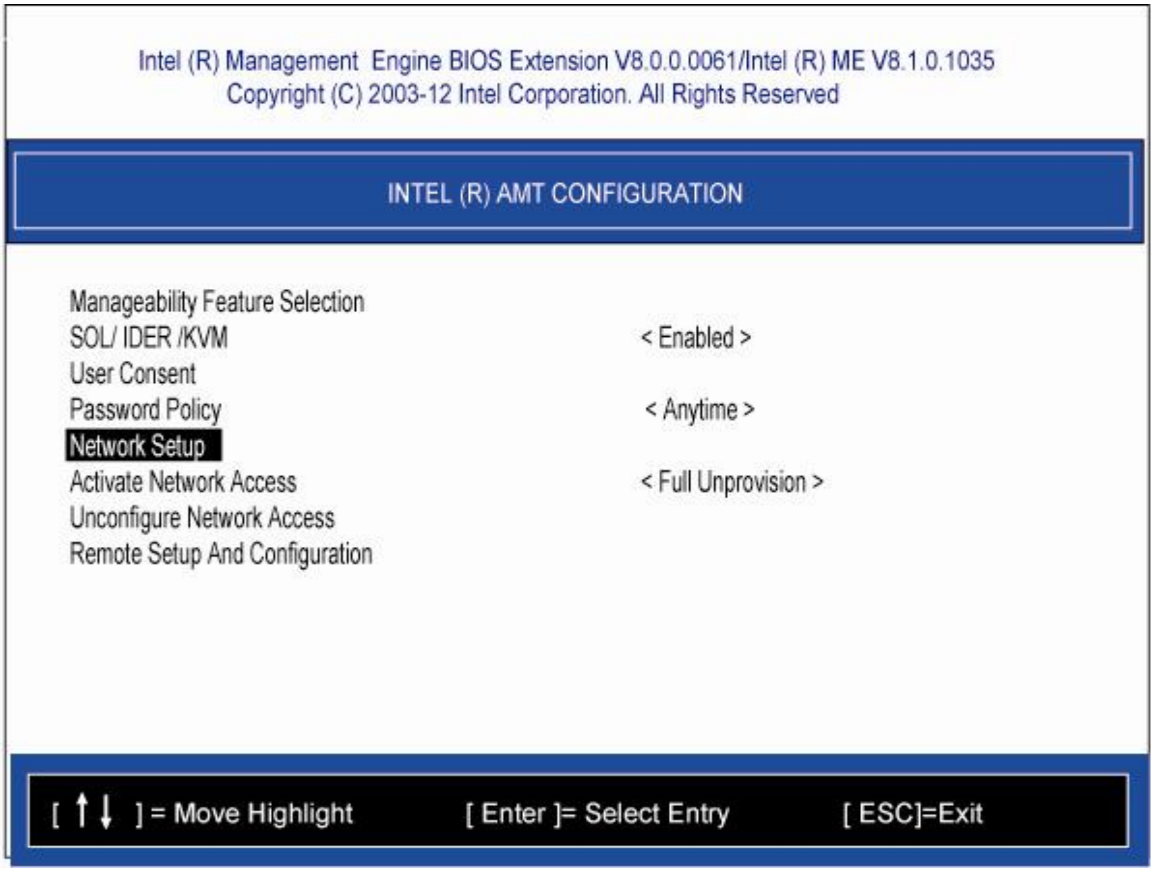
D.3 Intel® iAMT Settings

Select Intel® AMT Configuration and press <ENTER>.



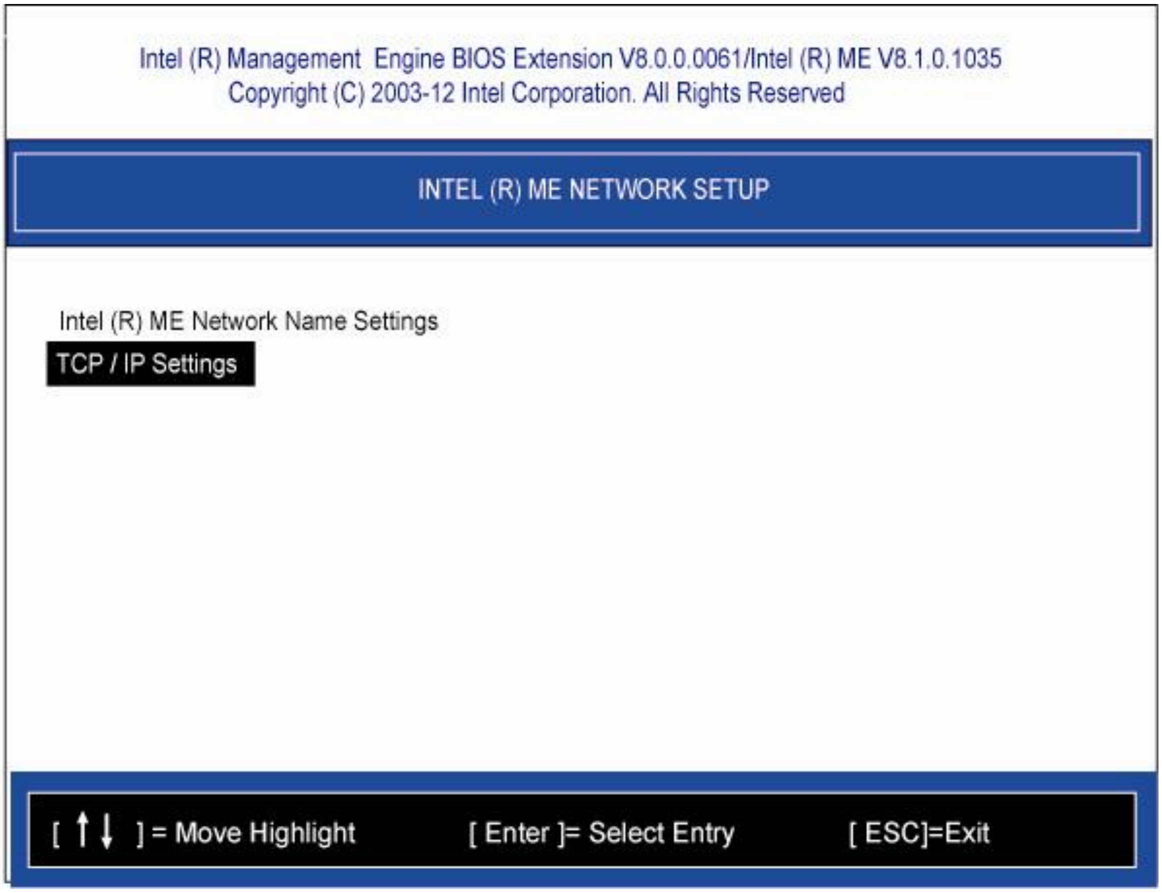
1. Select Network Setup to configure AMT.

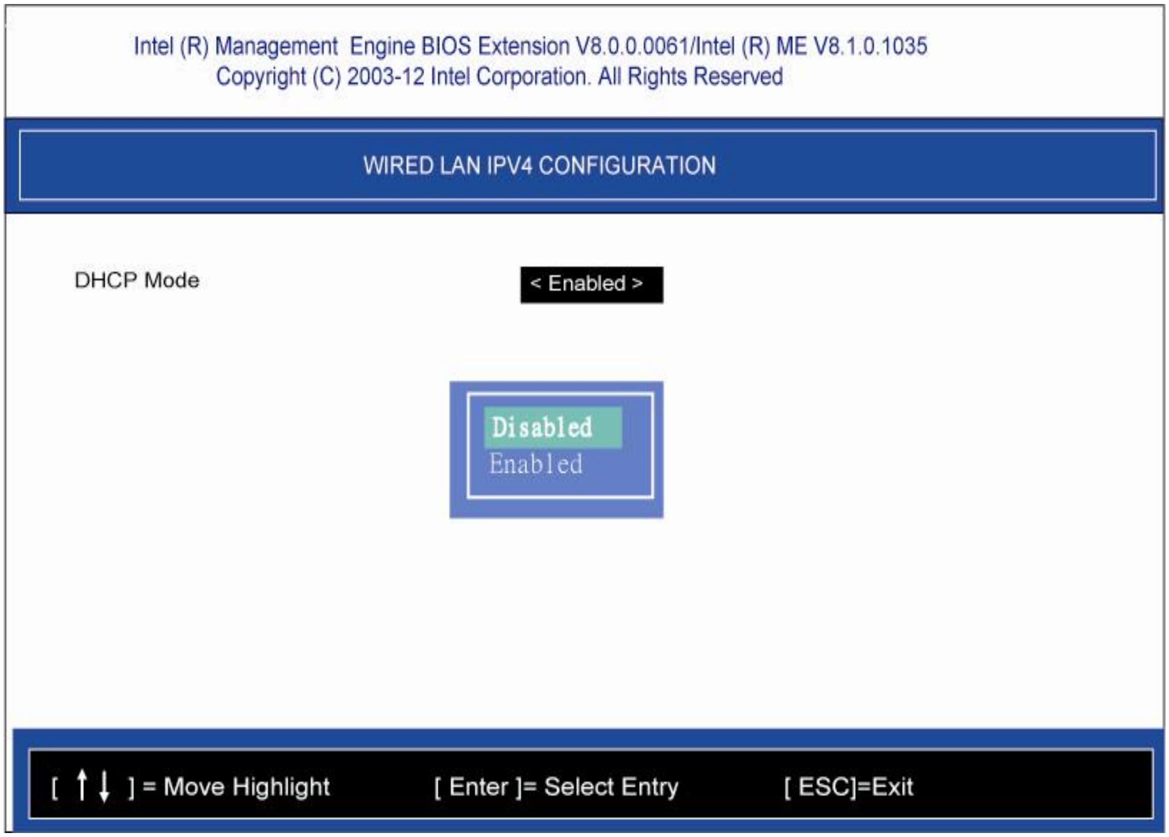
(3-1)



2. Select TCP/IP to get into Network interface, and set it to 'ENABLED'; into DHCP Mode, and set it to 'DISABLED' (as Remark 2) ;

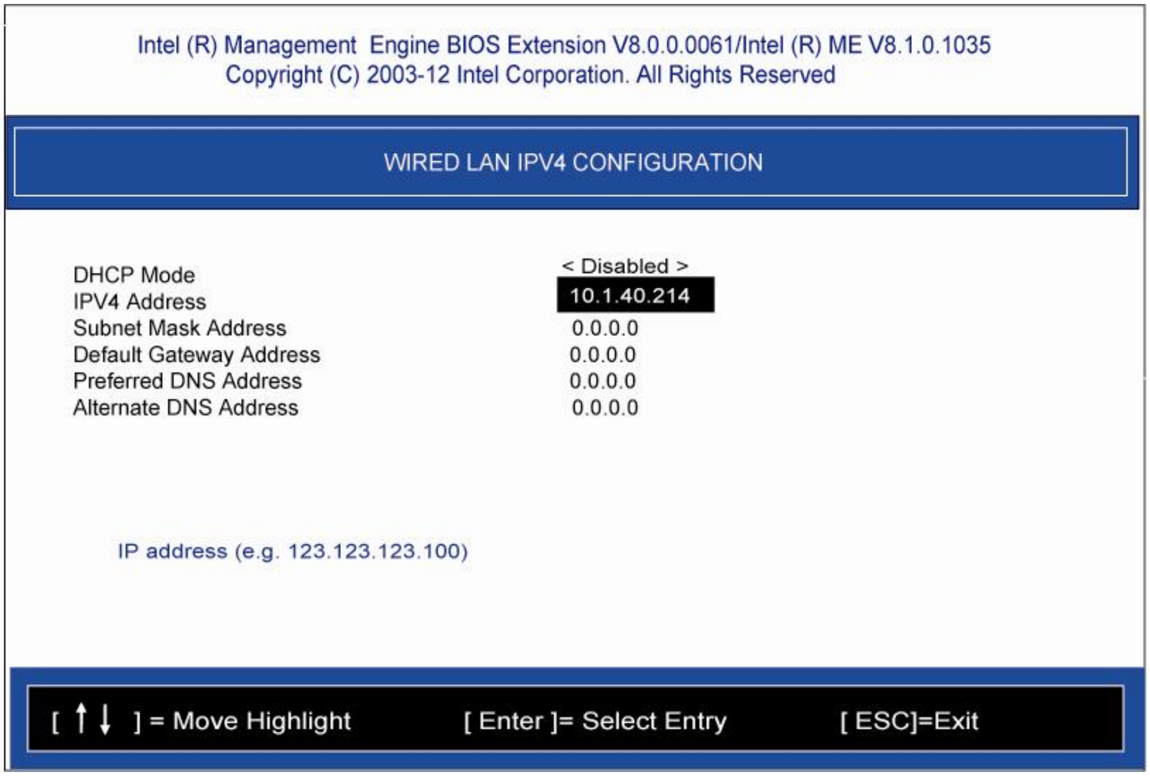
(3-2)



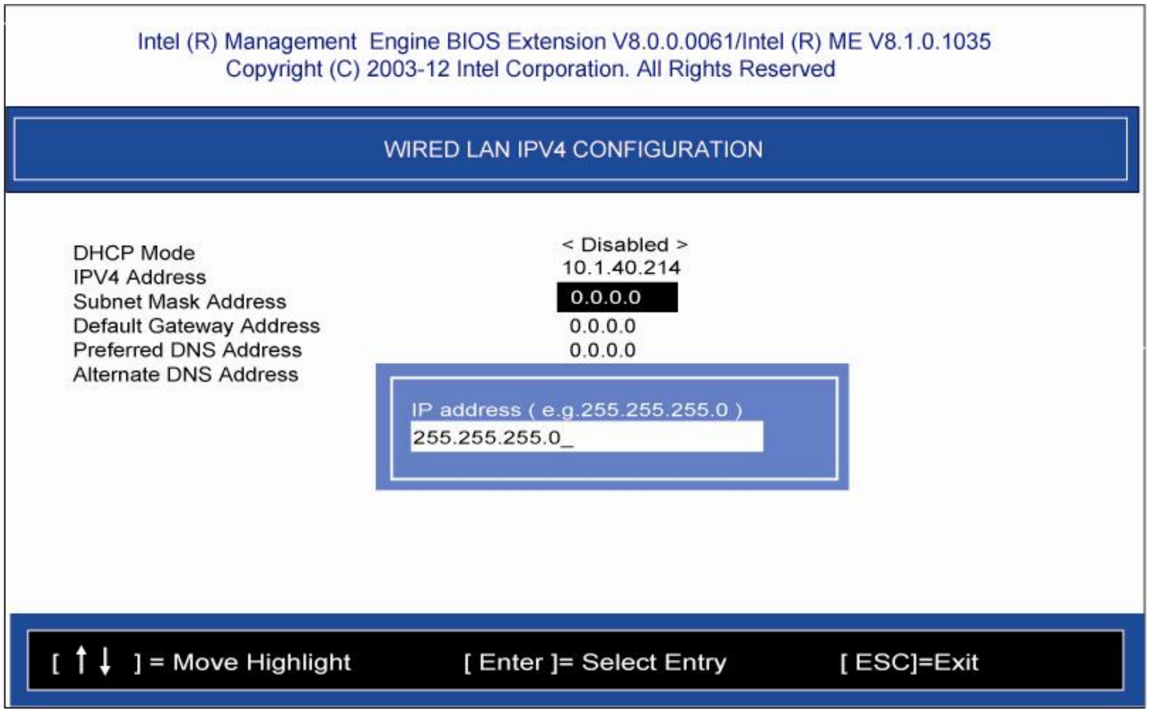

Intel (R) Management Engine BIOS Extension V8.0.0.0061/Intel (R) ME V8.1.0.1035
Copyright (C) 2003-12 Intel Corporation. All Rights Reserved
WIRED LAN IPV4 CONFIGURATION
DHCP Mode
< Enabled >
Disabled
Enabled
[↑↓] = Move Highlight
[Enter]= Select Entry
[ESC]=Exit

3. if DHCP Mode is disabled, e following settings:

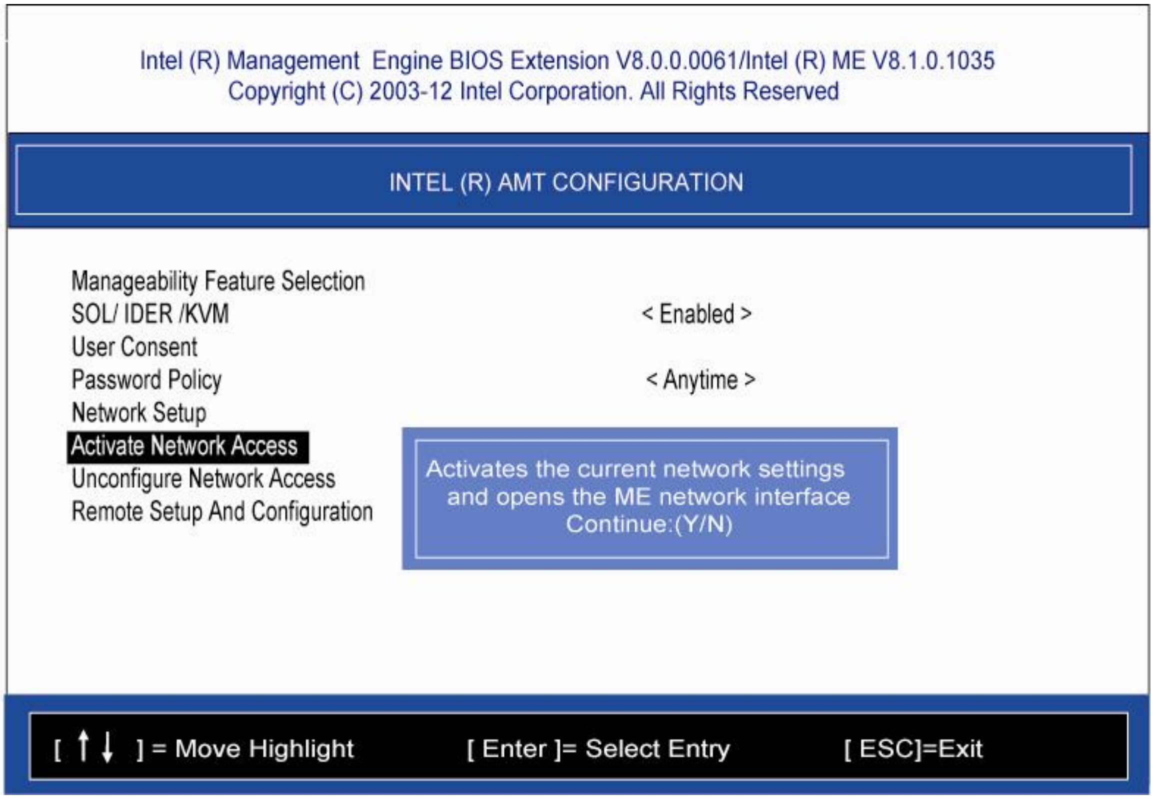
- **IP address**



- **Subnet mask**


Intel (R) Management Engine BIOS Extension V8.0.0.0061/Intel (R) ME V8.1.0.1035
Copyright (C) 2003-12 Intel Corporation. All Rights Reserved
WIRED LAN IPV4 CONFIGURATION
DHCP Mode
IPV4 Address
Subnet Mask Address
Default Gateway Address
Preferred DNS Address
Alternate DNS Address
< Disabled >
10.1.40.214
0.0.0.0
0.0.0.0
0.0.0.0
IP address (e.g.255.255.255.0)
255.255.255.0_
[↑↓] = Move Highlight
[Enter]= Select Entry
[ESC]=Exit

4. Back to Intel (R) AMT Configuration, then select Activate Network Acess and press <ENTER>.

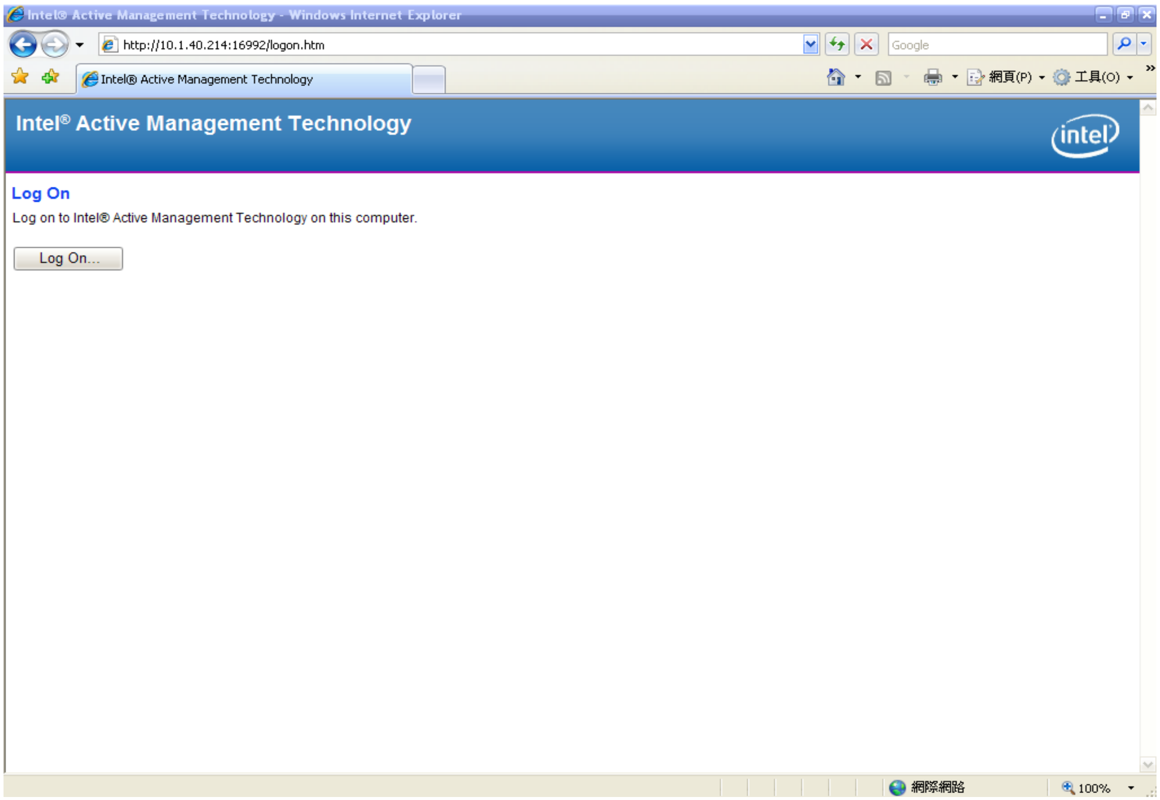


5. Exit from MEBx after completing the iAMT settings.

D.4 iAMT Web Console

1. From a web browser, please type http://(IP ADDRESS):16992, which connects to iAMT Web.

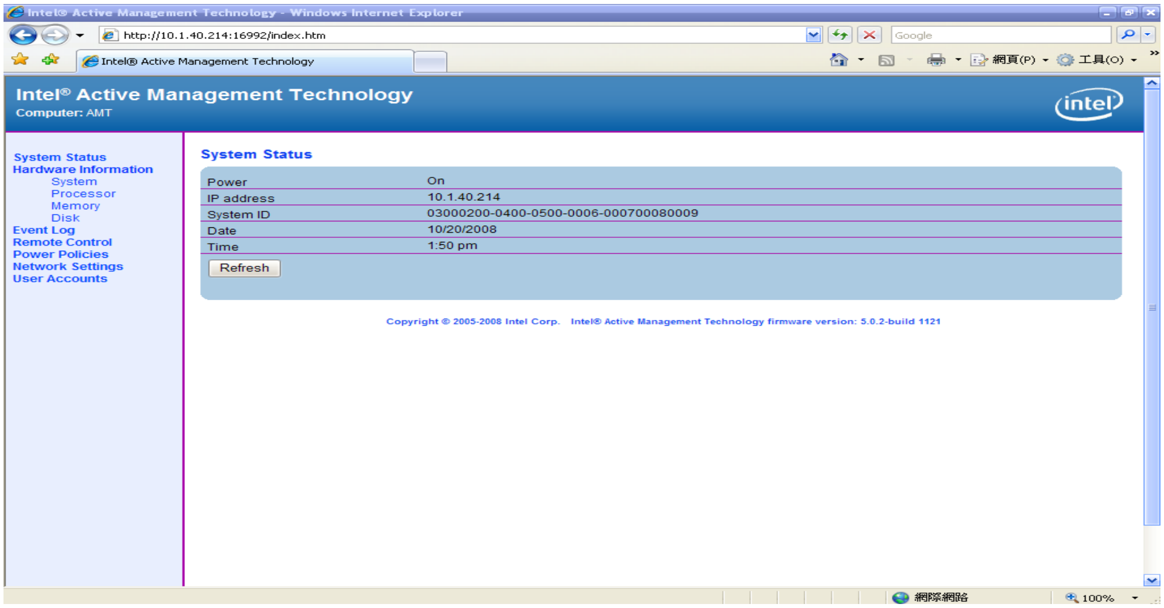
Example: http://10.1.40.214:16992



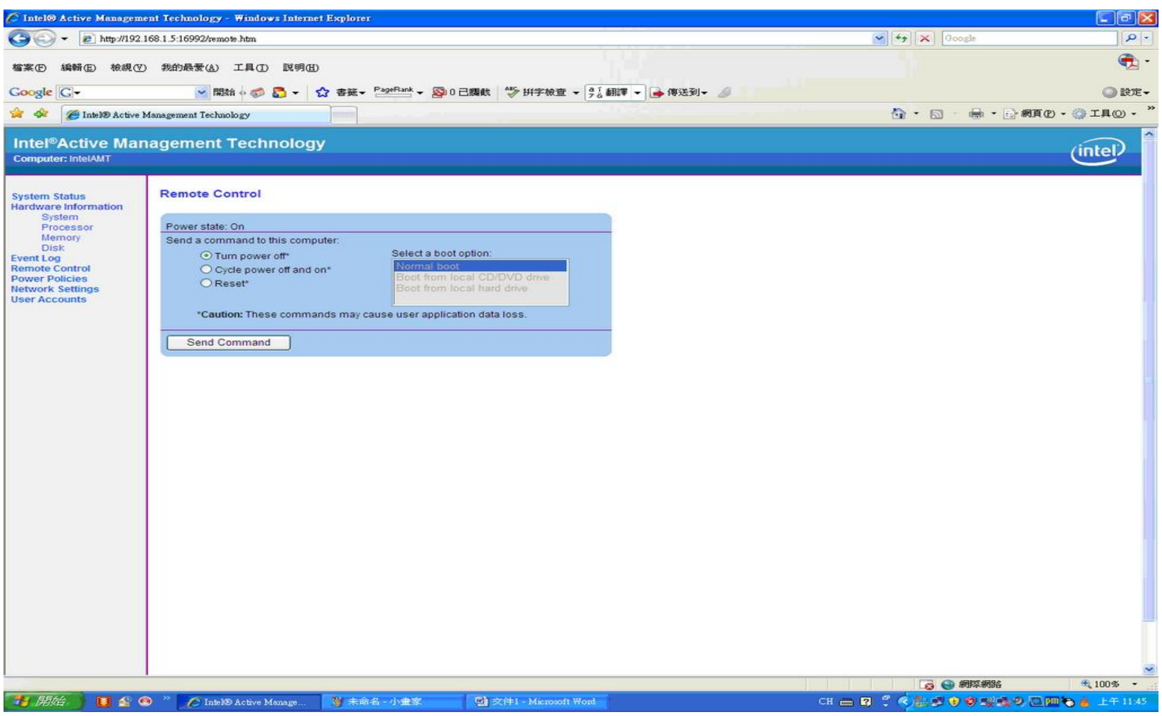
2. To log on, you will be required to type in username and password for access to the Web. USER: admin (default value)

PASS: (MEBx password)

3. Enter the iAMT Web.



4 Click Remote Control, and select commands on the right side.



5. When you have finished using the iAMT Web console, close the Web browser

MEMO:

APPENDIX E
PICMG® v1.3 INTERFACE DEFINITION

x16 PCIe Connector A			x16 PCIe Connector C		
	Side B	Side A		Side B	Side A
1	N.C	N.C	1	USB0P	GND
2	GND	GND	2	USB0N	GND
3	N.C	N.C	3	GND	USB1P
4	N.C	N.C	4	GND	USB1N
5	N.C	WAKE#	5	USB2P	GND
6	PWRBT#	PME#	6	USB2N	GND
7	PWRGD	PSON#	7	GND	USB3P
8	SHB_RST#	PERST#	8	GND	USB3N
9	CFG0	CFG1	9	USBOC0#	GND
10	CFG2	CFG3	10	GND	USBOC1#
11	RSVD	GND	11	USBOC2#	GND
Mechanical Key					
12	GND	N.C	12	GND	USBOC3#
13	b_PETp0	GND	13	N.C	GND
14	b_PETn0	GND	14	N.C	GND
15	GND	b_PERp0	15	GND	N.C
16	GND	b_PERn0	16	GND	N.C
17	b_PETp1	GND	17	N.C	GND
18	b_PETn1	GND	18	N.C	GND
19	GND	b_PERp1	19	GND	N.C
20	GND	b_PERn1	20	GND	N.C
21	b_PETp2	GND	21	N.C	GND
22	b_PETn2	GND	22	N.C	GND
23	GND	b_PERp2	23	GND	N.C
24	GND	b_PERn2	24	GND	N.C
25	b_PETp3	GND	25	N.C	GND
26	b_PETn3	GND	26	N.C	GND

Mechanical Key					
27	GND	b_PERp3	27	GND	N.C
28	GND	b_PERn3	28	GND	N.C
29	REFCLK0+	GND	29	N.C	GND
30	REFCLK0-	GND	30	N.C	GND
31	GND	REFCLK1+	31	N.C	N.C
32	RSVD	REFCLK1-	32	N.C	N.C
33	REFCLK2+	GND	33	N.C	N.C
34	REFCLK2-	GND	34	N.C	GND
35	GND	REFCLK3+	35	N.C	GND
36	RSVD	REFCLK3-	36	GND	N.C
37	REFCLK4+	GND	37	GND	N.C
38	REFCLK4-	GND	38	N.C	GND
39	GND	N.C	39	N.C	GND
40	RSVD	N.C	40	GND	N.C
41	N.C	GND	41	GND	N.C
42	N.C	GND	42	+3.3V	+3.3V
43	GND	N.C	43	+3.3V	+3.3V
44	GND	N.C	44	+3.3V	+3.3V
45	a_PETp0	GND	45	+3.3V	+3.3V
46	a_PETn0	GND	46	+3.3V	+3.3V
47	GND	a_PERp0	47	+3.3V	+3.3V
48	GND	a_PERn0	48	+3.3V	+3.3V
49	a_PETp1	GND	49	+3.3V	+3.3V
50	a_PETn1	GND	50	+3.3V	+3.3V
51	GND	a_PERp1	51	GND	GND
52	GND	a_PERn1	52	GND	GND
53	a_PETp2	GND	53	GND	GND
54	a_PETn2	GND	54	GND	GND
55	GND	a_PERp2	55	GND	GND
56	GND	a_PERn2	56	GND	GND
57	a_PETp3	GND	57	GND	GND

Mechanical Key					
58	a_PETn3	GND	58	GND	GND
59	GND	a_PERp3	59	+5V	+5V
60	GND	a_PERn3	60	+5V	+5V
61	a_PETp4	GND	61	+5V	+5V
62	a_PETn4	GND	62	+5V	+5V
63	GND	a_PERp4	63	GND	GND
64	GND	a_PERn4	64	GND	GND
65	a_PETp5	GND	65	GND	GND
66	a_PETn5	GND	66	GND	GND
67	GND	a_PERp5	67	GND	GND
68	GND	a_PERn5	68	GND	GND
69	a_PETp6	GND	69	GND	GND
70	a_PETn6	GND	70	GND	GND
71	GND	a_PERp6	71	GND	GND
72	GND	a_PERn6	72	GND	GND
73	a_PETp7	GND	73	+12V	+12V
74	a_PETn7	GND	74	+12V	+12V
75	GND	a_PERp7	75	+12V	+12V
76	GND	a_PERn7	76	+12V	+12V
77	N.C	GND	77	+12V	+12V
78	+3.3V	+3.3V	78	+12V	+12V
79	+3.3V	+3.3V	79	+12V	+12V
80	+3.3V	+3.3V	80	+12V	+12V
81	+3.3V	+3.3V	81	+12V	+12V
82	RSVD	RSVD	82	+12V	+12V

X8 PCIe Connector B			X8 PCIe Connector D		
	Side B	Side A		Side B	Side A
1	+5Vaux	+5Vaux	1	INTB#	INTA#
2	GND	N.C	2	INTD#	INTC#
3	a_PETp8	GND	3	GND	N.C
4	a_PETn8	GND	4	REQ3#	GNT3#
5	GND	a_PERp8	5	REQ2#	GNT2#
6	GND	a_PERn8	6	PCI_RST#	GNT1#
7	a_PETp9	GND	7	REQ1#	GNT0#
8	a_PETn9	GND	8	REQ0#	SERR#
9	GND	a_PERp9	9	N.C	+3.3V
10	GND	a_PERn9	10	GND	N.C
11	N.C	GND	11	N.C	GND
Chanical Key					
12	GND	N.C	12	CLKC	CLKD
13	a_PETp10	GND	13	GND	+3.3V
14	a_PETn10	GND	14	CLKA	CLKB
15	GND	a_PERp10	15	+3.3V	GND
16	GND	a_PERn10	16	AD31	GND
17	a_PETp11	GND	17	AD29	+3.3V
18	a_PETn11	GND	18	N.C	AD30
19	GND	a_PERp11	19	AD27	AD28
20	GND	a_PERn11	20	AD25	GND
21	a_PETp12	GND	21	GND	AD26
22	a_PETn12	GND	22	C/BE3#	AD24
23	GND	a_PERp12	23	AD23	+3.3V
24	GND	a_PERn12	24	GND	AD22
25	a_PETp13	GND	25	AD21	AD20
26	a_PETn13	GND	26	AD19	N.C
27	GND	a_PERp13	27	+5V	AD18
28	GND	a_PERn13	28	AD17	AD16

Chanical Key					
29	a_PETp14	GND	29	C/BE2#	GND
30	a_PETn14	GND	30	PCI_PRST#	FRAME#
31	GND	a_PERp14	31	IRDY#	TRDY#
32	GND	a_PERn14	32	DEVSEL#	+5V
33	a_PETp15	GND	33	LOCK#	STOP#
34	a_PETn15	GND	34	PERR#	GND
35	GND	a_PERp15	35	GND	C/BE1#
36	GND	a_PERn15	36	PAR	AD14
37	N.C	GND	37	N.C	GND
38	N.C	N.C	38	GND	AD12
39	GND	GND	39	AD15	AD10
40	GND	GND	40	AD13	GND
41	GND	GND	41	GND	AD09
42	GND	GND	42	AD11	C/BE0#
43	GND	GND	43	AD08	GND
44	+12V	+12V	44	GND	AD06
45	+12V	+12V	45	AD07	AD05
46	+12V	+12V	46	AD04	GND
Mechanical Key					
47	+12V	+12V	47	GND	AD02
48	+12V	+12V	48	AD03	AD01
49	+12V	+12V	49	AD00	GND

Note: Please contact your vendor to get the backplane design guide if it's required. The backplane design guide is NDA required.

MEMO: